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SEWER AND DRAIN.

THE expenditure of local authorities has become one of the prominent questions of the day. All over the country there is a growing demand for municipal economy, and it is to be feared that this demand, praiseworthy in itself, may, if unwisely directed, react injuriously upon the efficiency of local administration and seriously impede the development of preventive medicine. To secure economy while increasing efficiency, is, of course, the ideal, and it is always gratifying to be able to point to measures which would obviously bring about so desirable a result. Such a measure is to be found in an amendment of the law relating to combined drainage; although this is a subject which, unfortunately, has not yet received the attention it deserves from the numerous ratepayers' associations that have come into existence during recent years.

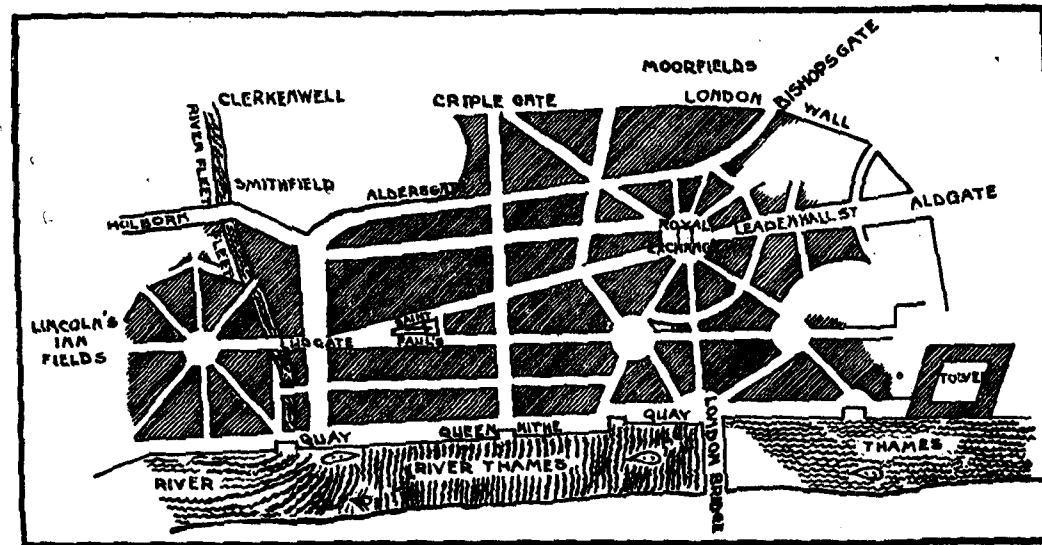
Since the year 1893, when the case of *Travis v. Uttley* was decided, local authorities have been obliged to expend large sums of money in the repair of what are practically private drains, although, in the eye of the law, they appear as "sewers," for which the local authorities are responsible. What the total expenditure has been is not known, but it must be enormous. As regards the loss incurred by London ratepayers, some idea may be formed from the interesting report which has recently been prepared by Mr. A. Powell Coke, the Chief Clerk in the St. Pancras Health Department, some extracts from which appear in another column. Mr. Coke has ascertained that during the nine financial years ending 1907-08 the sum known to be

expended by the Metropolitan Borough Councils in the repair and maintenance of combined drains is not far short of £250,000, and he points out that even this vast sum does not represent the total expenditure, because in several boroughs the cost of combined drainage has not been separated from the cost of the general maintenance of sewers. In the borough of Islington alone a rate of over a halfpenny in the £ is paid annually for maintaining combined drains. And one must not forget the cost of the expensive litigation in which local authorities have been involved in this vexed question of sewers and drains. Here, evidently, there is a most promising field for the energies of the municipal economist.

That the present legal position of the combined drainage question is unsatisfactory is generally admitted in all public discussions on the subject. The Lord Chief Justice has expressed the opinion that "the state of authorities is such that it appears to be impossible either to reconcile the various decisions, or to deduce from them any logical rule"; and Mr. Walter Long, in reply to a deputation which, as President of the Local Government Board, he received in June, 1903, made an unambiguous statement of the necessity for amending legislation. Several provincial authorities and one metropolitan authority—Woolwich—have, by means of private Acts, succeeded in relieving their ratepayers from the burden of combined drainage repairs, and it is time the whole question was dealt with by general legislation. The subject is not free from difficulty, but the difficulties arise chiefly, if not entirely, from the opposition of vested interests, and are of the kind that yield to resolute treatment.

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PLAN II.—SIR CHRISTOPHER WREN'S SCHEME FOR THE REBUILDING OF LONDON
AFTER THE GREAT FIRE, 1666.

Street was to have become a canal 120 feet wide. Wren evidently had an eye to the public health, as understood in his day, as well as to convenience and beauty. Churchyards were to be removed as a precaution against the plague; and it was intended for "all churchyards, gardens and unnecessary vacuities, and all trades that use great fires, or yield noisome smells, to be placed out of town." The need of fresh air and open spaces, mere "vacuities," as they seemed to him, was unknown.

But, alas, the corporation had insufficient powers; the claims of property owners were conflicting; all were in a hurry to rebuild, and only something was preserved of this masterly scheme in the alignment of the houses, in the comparative width of the streets, and in the substance of the material and style of building employed.

The principle of town-planning had, therefore occurred early to one or two master minds; but the necessity for it has only gradually become apparent to the public with the increase of population, the transference of industry from the home to the factory, the improvement of communications, and the rapid growth of towns during the last century. It was a century ago that Robert Owen proposed the foundation of industrial villages on communistic principles, and obtained much distinguished support, including that of the Duke of Kent, and £55,000 of subscriptions for his model town of "Harmony," and his Philanthropic Society for the Permanent Relief of the

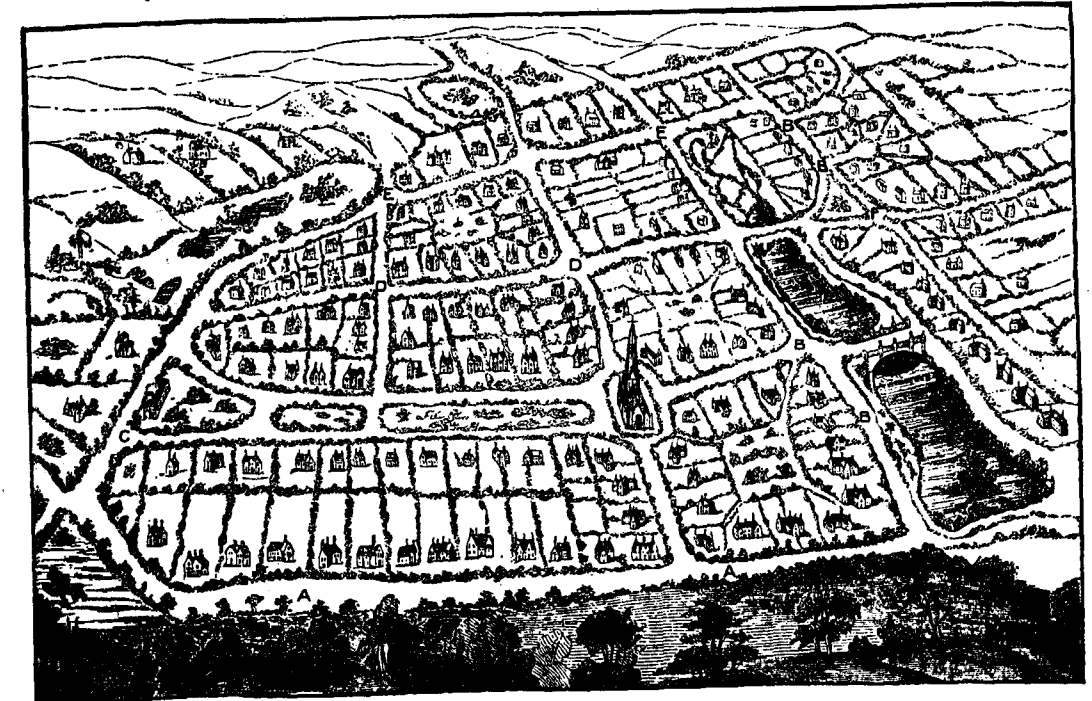
Working Classes. He bought a large estate in America, twelve miles from Mount Vernon on the River Ohio, and the plan for his town was published in *The Garden City* for February, 1907. Standing in the centre of 2,000 acres, it was to consist of a square of buildings 1,000 feet long, with public buildings in the centre and corners, and an "administrative block" and gigantic chimney each side occupying a fair part of the open space within. The building looks like a large prison. Owen's opponents giped at "life in parallelograms"; and both this and a corresponding scheme for Queenwood, Hants, were doomed to failure.

So with Pemberton's scheme in 1854 for ten towns, on a circular plan, to cover 200,000 acres in New Zealand; so with that in 1848 of Mr. Buckingham, M.P. for Sheffield, from 1832 to 1837, for a city on the Solent, at a cost of £4,000,000, to be called Victoria. The latter, however, shows a remarkable advance on Owen's plans, and many resemblances to those of Ebenezer Howard, who knew of it, however, only after he had conceived his own plan. Buckingham's "Model-Town" was to contain every improvement in its position, plan, drainage, ventilation, architecture, supply of water, light and every other elegance and convenience which the improved state of art and science would admit of. It was to be a mile square, to contain not more than 10,000 inhabitants, and to be surrounded by 10,000 acres of farm land. Factories were to form a ring near the outer edge of the town, and the

plan shows far greater attention to architecture and the need of open spaces than Owen's, although the town was still bounded by a palisade of barrack-like buildings on every side. The scheme, however, was based on compulsory co-operation, and failed like the rest. Of these early schemes, one of the most

despair of seeing every large town, within a circle of miles around its present suburbs, surrounded with new suburbs, abounding with all the advantages of town and all the attractions of country life."

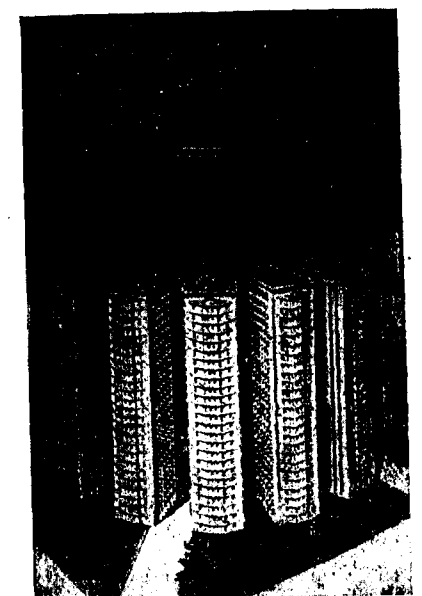
But with all these schemes of growing value, working towards a solution of the urban



PLAN III—MOFFATT'S SCHEME FOR A GARDEN-VILLAGE AT ILFORD, ESSEX, 1845.

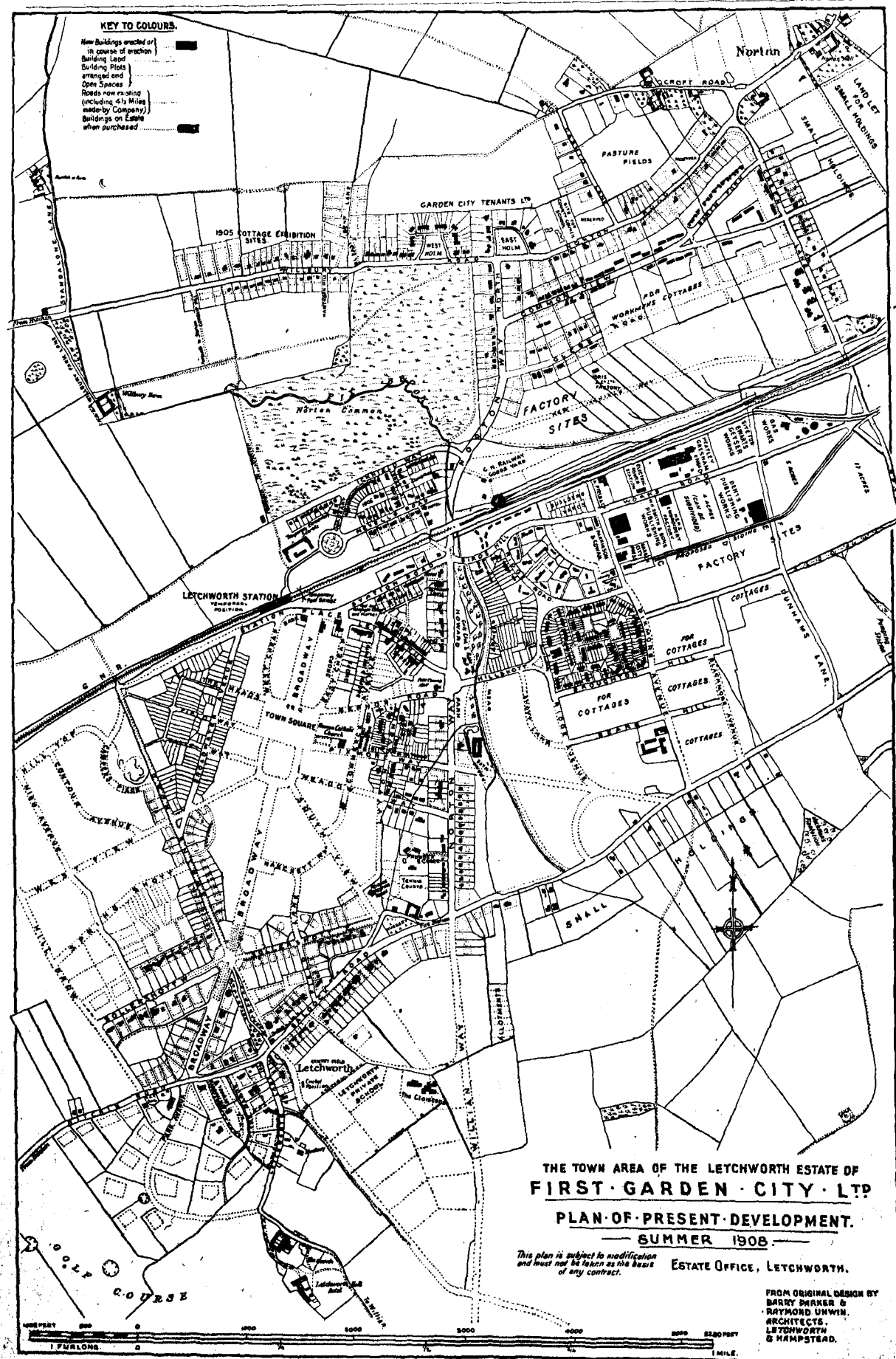
striking at the present time is that of Moffatt, a London architect, in 1845, for a "Village Association," with a capital of £10,000,000, to erect garden villages within ten miles of the metropolis, and house 350,000 persons; and, when this proved a financial impossibility, for a single model village at Ilford, with a capital of £250,000. The capital appears to have been secured, a site bought at one-tenth the price of building land nearer London, and 1,000 houses were to be built and let at yearly rentals of £12 10s. to £40. The plan is, in principle, remarkably like that which has been now adopted at Letchworth; it was directly intended for the poorest classes; and when met with the objection that it would only withdraw the artisans, clerks and small tradesmen from the towns, fresh endeavours were made to secure the inclusion of those for whom it was intended, and whom its promoters considered the main pillar of the fabric of Society to be "climbed into the State by every nail that could be legitimately driven and riveted." The comment in the *Edinburgh Magazine* of the day was far-sighted: "We need not

problem, there appeared at the same time much that was extravagant; and as an example of such extravagance none can surpass the beehive-proposal of the author of "Drift."



PLAN IV.

Who can be surprised at the suspicion aroused



PLAN VII. MAP OF FIRST GARDEN CITY, LETCHWORTH, 1908.

the new naval base on the Forth. Five thousand men are to be stationed here, requiring for themselves some 3,000 houses, and as many again for the small traders and others to supply their needs. In Dunfermline, only five miles off, are industries involving a great demand for female labour. Will the Government allow another Devonport or Portsmouth to grow up, with large ground-rents enriching the private owners of property and making healthy improvements well-nigh impossible—as, for instance, at Richmond (Surrey), where land for street widening cost £250,000 per acre—or will they acquire the land in advance; or will they regulate the development in the hands of private owners? Their natural disposition is to shelve the question, and allow the contractors engaged in the construction of the naval works to lay a sure foundation of future slums in the shanties and flimsy buildings they will erect for their workmen and works. The Admiralty have bought some 1,600 acres, and intend to keep them free of buildings; but outside this area, especially around Dunfermline and Inverkeithing, land must already be rising rapidly in price, and that increment—justly due to the nation and Government that creates it—goes to the private owner. The official reply is that it is not the business of the Government to speculate in land; in other words, a refusal to look plain facts in the face, and a refuge in a plausible catchword—to speculate, with its insinuation of immorality. There is, however, no hazard in the matter at all. The Government, in refusing to buy up sufficient land for the town they are about to create, are deliberately forfeiting for the nation a large source of wealth.

Health, however, may still be preserved—apart from public ownership of land—by strong and well-considered town planning, as well as housing regulations; and it is well to note at Rosyth this instance of the fact that municipal land-ownership is wholly distinct from the question of town-planning, with which it is incorporated in the First Garden City, but from which it is separated in many garden suburb and village schemes already enumerated. The system of municipal or other co-operative ownership of land and houses has indeed much to recommend it to the sanitarian, as well as the economist, when the municipal or co-operative owner is keenly alive to the needs of health and economy. It has been very largely encouraged by building

societies, and by the operations on a large and increasing scale of such bodies as the Co-operative Tenants, Ltd., in Garden City, Ealing and Hampstead, with their hundreds of houses in each place potentially owned by their proprietors. This, however, is mainly an economic and social question. We in this society will do well to confine our attention to the regulation of town-planning, apart from ownership.

TOWN PLANNING ABROAD.

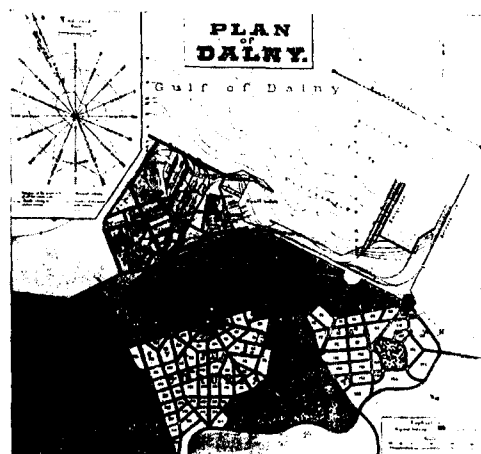
The idea of town-planning, it has been already shown, is not new. Nor is it limited to this country. Adelaide, the capital of South Australia, has limited the growth of its population for any one area to certain limits, beyond which it develops in separate communities across intervening unoccupied "park lands." North Adelaide has thus grown up separated from the original Adelaide by park lands half as wide as the original town. Through this interval flows the River Torrens: into it from the north-west comes the railway, skirting the limits of North Adelaide; its eastern part is occupied by the extensive Botanical Gardens.

The Ring-Strasse, in Vienna, is a striking example of a fine main thoroughfare, not uncommon in continental towns, in which it often occupies the site of the obsolete fortifications, no longer necessary or, if defence were needed, of any strategic value. A proposal for a similar use of the extensive fortifications surrounding Paris is now before the local authorities. They were built only sixty years ago and have been considerably enlarged since 1871. What a comment on the history of the last forty years!

But for heroic town-planning in a mediæval city commend me to Georges Hausmann, who, in the twenty-two years of Louis Napoleon's presidency and reign completely transformed Paris with his magnificent boulevards and bold perspective. Washington, again, the city of splendid distances, is another instance of a city—designed, be it said, by a French officer of engineers in the eighteenth century—with majestic thoroughfares radiating from a centre, in this case from the impressive, dominating capital, as the western boulevards of Paris radiate from the Arc de Triomphe. But Paris is an example of curative; Washington of preventive town-planning. Paris is unique, while Washington is the type, it may be hoped, in certain respects, of all large cities yet to be established. Boston would aspire to

surpass either, by the plan of the Metropolitan Parks' Commission, drawn out on a sumptuous scale, for its future in 1950 up to a radius of twenty miles from State House.

The most surprising instance, however, of bold town-planning was one I discovered in a visit to Manchuria during the recent war. The Russians had already gone far to develop the port of Dalny, forty miles up from Port Arthur on the Liao-Tung peninsula, on a remarkably complete, preconceived, radial scheme, when they lost possession of it to the Japanese in 1904.



PLAN VIII.

Alongside a magnificent harbour were ranged the warehouses, arsenal and government buildings required for the purposes of the port and general administration. Above the harbour a large area was laid out for the town, divided by roads, which radiated from the church at its centre, on the most mathematical plan, into sections to be allotted to different races and classes of the population. Many residential villas on this plan had already been built on the side towards the harbour. It will be interesting to see how Japan follows out the development shadowed in this scheme.

But as Russia was ahead of the times in a place where there was no urgent need for a town-planning scheme, so was our Crown Colony of Hong-Kong asleep to all such need, at least in 1904, in the face of the most urgent necessity. Hong-Kong is an island, separated from the south coast of China by an arm of the sea, as the Isle of Wight from Southsea by the Solent. The intervening sea is narrowed at either entrance to form a vast harbour; but the island is mountainous, rising almost abruptly out of the sea, and there is along the waterside on the north side of the

island, facing the harbour, only a limited space for the development of the city of Victoria, with its six-figure population. Now the mainland opposite has by a recent treaty come into our hands; a considerable promontory jutting out into the harbour has long been ours; and with the plague endemic amongst the congested Chinese population of Victoria, and with the growing establishment of wharves, barracks and go-downs on the north side of the harbour, the need for a comprehensive town-planning scheme for this Kowloon territory would seem obvious. Perhaps such a scheme has now been prepared. But a report I was privileged to make to the then acting Governor in 1904 on the subject was reckoned utopian.

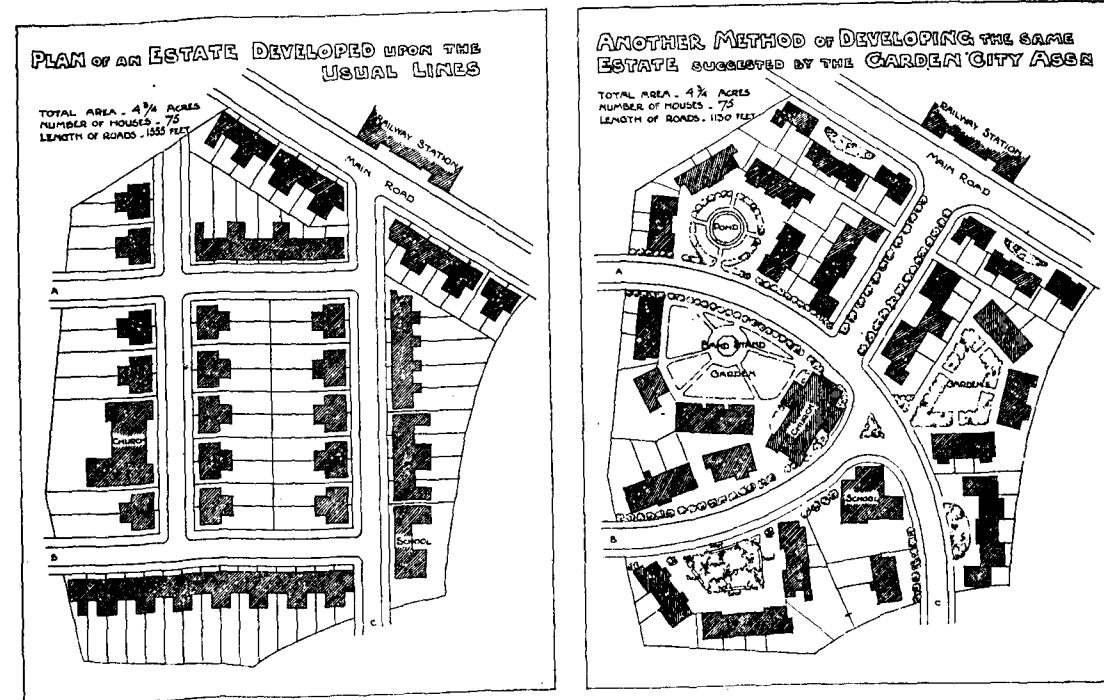
Would it be utopian to suggest a similar provision in Canada for that most surprising of cities, Winnipeg, which in 1904 was showing a great hurry to grow up, had in ten years doubled its population, and in the next ten was to become the junction of East Canada and West, and the largest city in the Dominion? The development had been to a certain extent planned; but the planning required a stronger hand. North America, indeed, is notorious for its unduly mathematical designs of city-growth; the maps of San Francisco and Chicago are, or were, divided into hundreds of rectangular blocks of equal size; if a hill were in the way, the hill would be removed, or the road run straight up it or through it; and the map of New York, with its eleven "Avenues" intersected at right angles by 160 odd "Streets," looks more like a diagram than a map. This may be inelegant, although Christopher Wren planned his streets in straight lines; it may be defective in our eyes, with its lack of open spaces *ad hoc*, especially if there is no control over the sky-line; but it at least shows that the Americans keep a tight hold of the development of their cities. The American seldom restrains his activities unless to do so is worth his while. And in Baltimore, a destructive fire four months before my visit to it, had supplied the opportunity required. The occasion had already been put to good use.

Other countries, however, do not consider the ideals of town-planning utopian. With France, and, as regards law, with the United States, Great Britain has lagged behind. Even Sweden, by a building law enacted the principal in 1874; Holland, in '51; Belgium, in '36; and town extension in Germany was the subject of a somewhat remarkable paper before this Society two years ago by Dr.

Robertson, the Medical Officer of Health for Birmingham—Birmingham, which has led the way in many building and other experiments of civic reform in recent years. Indeed, the Krupp firm at Essen have gone far towards the Garden City ideal in housing their population of over 100,000 on similar experimental principles; the records of these experiments, presented to me by the firm after a visit there in 1905, are a historic monument of housing reform. Three generations of the Krupp family have owned the ironworks at Essen, and each, in turn, has founded one or more "colonies," or detached villages, for their workmen and dependents, progressing by degrees from the original barrack-like dwelling to the ideals of our Garden City.

COMMENTS.

Finally, let us end with a few practical observations. Our last plan shows in contrast two methods of developing the same estate.



PLAN IX.—THE CONTRAST—UNPLANNING AND TOWN-PLANNING.

The very symmetry of the usual plan is its own condemnation, for some persons love their gardens, others are content with the public spaces; some will face a road, others will not; some like a separate house, others one in a row. Then again, the new method allows for long vistas, and so helps to raise the eyes beyond the 36 ft. breadth of street and the barren wall of houses usually opposite. Long

vistas, too, imply air. The length of roads to make and maintain in Plan IX, is 1,130 against 1,555 ft.; and if there is expense involved in the maintenance of the open spaces, it is well spent in return for the amenities they afford, and may be set off against the private gardens which, in the occupation of those who do not use them, become insanitary backyards, the depository of refuse, and a breeding place for flies.

In the second place, it is noticeable how much is to be gained in the proper laying out of roads. A road eventually intended for much traffic is laid down at first of sufficient width for two carts only to pass. The initial and annual expenses are, thereby, vastly reduced. Between the road and path, if there be one, is left a strip of any desired width for future widening, covered with its natural grass, planted, if desired, with a row of trees. Between path and houses, again, may be rows of front gardens, which are also of value, as

the London County Council finds in the Euston Road, for the widening of the thoroughfare. Road width may be further saved by carrying a road only to the end of a row of cheap cottages, for a cottager seldom changes his house, and his goods may then be easily carried down an 8 ft. lane to the end of the road.

In the third place, it may be well to record

a principle enunciated by Captain J. W. Petavel in his thoughtful and vigorous little book, "Administrative Efficiency," namely, that of linear extension. The conglomerative arrangement of the population is primarily due to former needs of mutual defence and to the limitations of pedestrian inter-communication. With modern methods of communication, however, the true method of urban development is along the tramway and railway lines, and so soon as the industrial, as well as the residential, development of a town acknowledges this principle, there would seem to be no limit to the possibilities of this gradual spread of towns, big and small, into the country, permeating it in all directions. Towns and villages, in fact, already grow, and in future they will mainly or entirely grow, by the method of linear extension. But, by whatever method it extends, the necessity for town-planning is urgent.

"Always look fifty years ahead, and, where possible, a hundred," was the precept laid down by the sanitary engineer, who, twenty-five years before, had laid out Kuala Lumpur, the up-country capital of the Straits Settlements, and who, in 1904, drove me round the broad roads, embankment and majestic spaces of that magnificent little capital with pardonable pride. Indeed, here is art, the art of the architect-surveyor, on new and larger lines. This new scope for his art was well appreciated in a recent paper by Mr. Paul Waterhouse to the Architectural Association, entitled "Laying out London." We want art, history, science, and all departments of civic life to enlarge their horizon from that of the house and the individual to that of the town. It is to this end that Professor Patrick Geddes made the notable suggestion at the Guildhall Conference in 1907, for the study, systematic survey and exhibit in local museums of the development of the local town, in order that its future growth may be adapted to future needs, and cleverly ordered and guided.

Whatever the fate of Mr. Burns' "Housing and Town-Planning, &c., Bill" may be, of this we may be sure: It has introduced the term town-planning into the parliamentary arena, and brought its principles to the light. It has given form to a movement long overdue; it is the stepping-stone to powers which can hardly be withheld, and that may be of very great value to the public health, both in country and town. Medical officers of health may with

advantage take any opportunity they can of seeing and studying the many experiments in town-planning now in progress. And not least should we remember the honour that is due to the man who discerned the grain from the chaff in earlier schemes for the re-housing of the people in bulk; who apprehended clearly the signs of the times in the industrial and commercial movements of the day; who reconciled the dogmas of social science with the variability of human feeling and method; to the modest shorthand writer, Ebenezer Howard, the author of the shilling book "Garden Cities of To-morrow."

LITERATURE OF TOWN-PLANNING.

1. HOWARD, E. *Garden Cities of To-morrow* 1/-
2. HARRIS, G. M., *The Garden City Movement* -/6
3. GUILDHALL CONFERENCE, 1907, *Town Planning in Theory and Practice* ... 1/-
4. *Garden Cities and Town Planning*—
A monthly penny magazine, giving useful and interesting current news of the movement, and recording progress of schemes, with plans and illustrations.
(The above and many useful pamphlets describing Bournville, Port Sunlight, Rosyth and other instances of town-planning, and dealing with various aspects of the problem, are to be had of the Garden City Association, Ltd., 602, Birkbeck Bank Chambers, W.C.)
5. THOMPSON, W. W., *Housing Handbook*, 1903
6. THOMPSON, W. W., *Housing Up-to-date*, 1907 } 7/6
(These books are a most useful compendium of information and law on the subject; they may be had separately).
7. SENNETT, A. R., *Garden Cities in Theory and Practice* (2 vols.) ... 21/-
8. MEAKIN, BUDGETT, *Model Factories and Villages* ... 7/6
9. BUCKINGHAM, J. SILK, *National Evils and Practical Remedies*
(Peter Jackson, St. Martin's-le-Grand, 1849.)
10. HAW, GEORGE, *No Room to Live* ... 2/6
11. MELINE, SENATOR JULES, *Return to the Land* ... 5/-
12. MASTERMAN, C. F. G., M.P. and HODGSON, *To Colonise England* ... 2/6
13. KAUFMANN, *Housing of the Working-classes* ... 1/-
14. ALDEN, PERCY, M.P., and HAYWARD, *Housing* (Headley Bros.) ... 1/-
15. NETTLEFOLD, J. S., *Practical Housing*, 1908 ... 1/-
16. GEDDES, Prof. P., *City Development* (The St. George's Press, Bournville, Birmingham) ...
17. PETAVEL, J. W., *Administrative Efficiency* 1/-

18. HORSFALL, T. C., *The Improvements of the Dwellings and Surroundings of the People, The example of Germany* (Manchester University Press) ... 2/-
19. SHAW, ALBERT, *Municipal Government in Continental Europe* ... 6/-
20. ABENDROTH, *Aufstellung von Bebauungs-plänen* (Heymann, Berlin) ...
21. CO-PARTNERSHIP 'TENANTS' HOUSING COUNCIL, 22, Red Lion Square, W.C., *Garden Suburbs, Villages and Homes* 1/6
22. *Report of the 8th International Housing Congress*, London, 1907 (432, Strand, W.C.) ... 1/-
23. *Report of Select Committee on Rural Housing*, 1907 ... 4/9
24. *Slum Reform and Town Planning* (Birmingham and District Housing Reform Association, 293A, Broad Street, Birmingham) ...
25. "MAGAZINE OF COMMERCE," 1903, *Garden Cities that Didn't Grow* ...
26. ROBERTSON, JOHN, M.D., B.Sc., M.O.H., Birmingham, *Some Aspects of the Housing Problem in German Towns* ("PUBLIC HEALTH," June 1906, Vol. xviii., p. 553) ...
27. FREMANTLE, F. E., *The Colonisation of Rural England* (Journal of Royal Sanitary Institute, Bradford, 1903, Vol. xxiv., Part iv.) ...

THE DANGERS OF SHUTTLE-KISSING.—There is one matter to which I should like to draw the attention of weavers, and that is the risks they run of contracting various infectious diseases from the custom of sucking the web through the eye of the shuttle, familiarly called "shuttle kissing." Almost daily looms are vacated through sickness or other cause, and without any attempt at disinfection or even simple cleansing of the shuttles, which in many cases show a distinct ring of filth round the eye, another weaver commences work on the same looms. I can easily conceive that in this way syphilis, diphtheria, consumption, and various other diseases can be communicated from one operative to another. I have discussed this matter with one of the most prominent mill managers in the township, and he is strongly of the opinion that in all mills it should be made a rule that whenever a fresh weaver commences to work at any loom or looms, the tackler should see that the shuttles are properly cleaned round the eyes. Simple scraping with sand paper and sponging with some good antiseptic lotion in and around the eye would entail practically no trouble or expense, and would at least tend to reduce the dangers which any sensible person will appreciate.—*Annual Report of Dr. A. E. Townley, Medical Officer of Health, Oswaldtwistle.*

STILL-BORN CHILDREN.

By J. D. JENKINS, M.D., B.S., D.P.H.,
Medical Officer of Health, Rhondda.

(From the Annual Report to the Rhondda Urban District Council, 1907.)

I AM indebted to Mr. Powell, the clerk to the Burial Board, for a record of the number of still-born children brought to the three cemeteries for burial during the years 1897-1907.

Year.	No. of still-born recorded.	No. of births registered.	Rate per 1,000 births.	Averages for 5-year periods.
1897 ...	229	4,109	55.7	63.7
1898 ...	210	4,120	50.9	
1899 ...	271	4,089	66.3	
1900 ...	312	4,469	69.6	
1901 ...	348	4,586	75.9	
1902 ...	333	4,937	67.5	68.8
1903 ...	333	4,897	68.0	
1904 ...	301	4,860	61.9	
1905 ...	367	4,664	78.7	
1906 ...	323	4,751	67.9	
1907 ...	346	4,381	71.6	

The figures relating to the whole country, as issued by the Registrar-General seem to imply that the mortality from premature birth is steadily increasing, and the fact is explained by stating that the number of children who would formerly have been buried as still-born have more recently been certified as having been born alive, and as having subsequently died from prematurity. This explanation is not supported by the evidence afforded by the statistics relating to the Rhondda for the last eleven years; if the period of the previous ten years be divided into two terms of five years each, the relation of the number of deaths attributed to prematurity to the total number of births registered in the district is found to be more in the first than in the second quinquennium by 1 per 1,000 births as shown in the following table:—

Year.	Deaths from Premature Births.	No. of Births registered.	Rate per 1,000 births.	Averages for 5-year periods.
1897 ...	72	4,109	17.5	14.9
1898 ...	53	4,120	12.8	
1899 ...	56	4,089	13.6	
1900 ...	66	4,469	14.7	
1901 ...	74	4,586	16.1	
1902 ...	53	4,937	10.7	13.9
1903 ...	84	4,897	17.1	
1904 ...	69	4,860	14.1	
1905 ...	62	4,664	13.3	
1906 ...	69	4,751	14.5	
1907 ...	68	4,381	14.1	

On the contrary, the opposite applies to the figures relating to the still-births, the ratio of the still-births to the total number of births registered being considerably greater in the second than in the first quinquennium, as shown in the first table given above.

A STAMMERING CLASS.

By ALFRED GREENWOOD, M.D., D.P.H.,

Medical Officer of Health, Blackburn.

(From the Annual Report to the Blackburn Education Committee, 1907.)

AT the beginning of April, 1907, the services of Mr. W. A. Yearsley, of the Auto-Phonic Academy, Accrington, were procured on behalf of the Blackburn Education Committee, for the purpose of teaching a class of stammering children taken from the public elementary schools of the borough, and also in order that such knowledge might be gained as would make it possible for other cases to be dealt with similarly, if this should be thought desirable.

A selection of sixteen boys and two girls was made, and a six weeks' course was commenced on April 10th, 1907.

The class was held at the technical school.

The type of stammering varied very much. Several scholars showed facial contortion and nervous symptoms when trying to speak. Some were worse than others.

The Board of Education recommend that all cases of stammering should be examined and reported upon by the medical officer to the education committee, who should distinguish between stammerers and stutterers, the former being the more easy to cure.

There should be, at least, two examinations, one before the course, and one after.

The stammerers are those who have never learned to articulate all sounds thoroughly, and who hesitate in consequence. Stutterers are the nervous cases who can articulate everything, but who hesitate from nervousness.

The Board of Education also recommend that the classes should not contain more than fifteen, if they are to receive full attention. Larger classes cannot be given the full advantage, especially if the courses were confined to half-time. It seems also preferable to divide the work into senior and junior sections, inasmuch as the same treatment probably would not suit Standard I. children, as would do for Standards VI. and VII.

There occurs, also, the very important question as to whether the mentally deficient children could be treated for speech defects. As 75 per cent. of mentally deficient children suffer from speech defects, it is very important that they should be treated, if possible.

Mr. Yearsley has stated that in 800 cases of

stammering, he found that 40 per cent. were hereditary, 29 per cent. arose from association and mimicry, 15 per cent. from sickness, and 16 per cent. from shock and fright.

He also found that 397 of these cases began to stammer between the ages of four and seven years, 227 between the ages of seven and nine, 134 between the ages of nine and twelve, and forty-two between the ages of twelve and twenty.

It is probable that improper respiration and vocalisation, associated with a highly nervous condition, characterises sufferers from this ailment. It is necessary, therefore, that any teaching should be systematic and continuous.

Mr. Yearsley utilises a series of exercises, and his course consists of tuition for four hours per day during the period of six weeks.

His daily régime for the first two weeks' instruction is as follows:—

Thirty minutes of the morning and afternoon are taken up with breathing exercises, which are divided into chest, diaphragmatic, costal, dorsal, waist, and abdominal breathing. Breath capacity and breath control are the chief purposes of these exercises, so that the pupil may acquire complete control over the muscles of respiration. The pupils are drilled for two-and-a-half hours daily through a course of vocal gymnastics. First by articulating the vowels on a natural tone, then by exercising the vocal organs on an explosive utterance. They are afterwards drilled in the rising and falling inflection of each vowel sound—firstly, a commencing sound with an effusive utterance rising to the full pitch voice, and, secondly, by beginning with explosive force and gradually sinking to the effusive tone again. Each vowel is then separately articulated on a prolonged natural tone, the idea being to cultivate the economical expenditure of breath during articulation.

Some of the pupils, after a few weeks' training, can keep up a fair volume of sound on any one of the vowels for a period of from thirty to forty seconds during one respiration. Thus the pupil gradually obtains an easy action of the mouth, and free action of the muscles of the throat during speech.

For another thirty minutes of the morning and afternoon the class is instructed in a combination of vocal, breathing and physical exercises. These exercises cause the pupil to observe uniformity in respiration and to follow the elocutionary exercises with rhythmic precision. In Mr. Yearsley's class the pupils

use dumb-bells, which are employed during articulation, in order to improve the physique and to co-ordinate action between breathing and vocal exercises.

The last half hour of the morning and afternoon instruction is devoted to recitation or reading. The reading is done syllabically and in a measured utterance, and for the first two weeks the rate of reading out is by metronome measure. During the second fortnight the pupils are tested in their ability to give individual demonstrations in respiration and voice production. The exercises, as produced during the first two weeks are still continued, but now more time is given to the scholars individually. During the fifth and sixth weeks' instruction the scholars are trained to give impromptu speeches, to debate, and to recite in a slow and deliberate manner.

The home life and influences are an important factor in the successful treatment of this affliction.

At the commencement of this course all the children were medically examined, and notes were taken as to the condition of the stutters, and as to whether adenoids and enlarged tonsils were present.

The chest of each child was measured, as follows:—The child in front of the observer with the feet together, the hands hanging vertically to the sides, the head erect, and the eyes looking straight in front.

On expanding his chest fully each child carried the arms backwards so as to obtain the full advantage of the width of the chest. The tape measure was carried round on a level with the nipples, passing posteriorly a little below the angles of the shoulder blades. The average of several measurements for the greatest inspiration and the greatest expiration were taken.

At the end of the six weeks' course the chests were again measured in the manner described above. It was then noticed that there was very little difference between the measurements taken at this time and those taken at the beginning of the course.

There was, however, a very marked improvement in the musculature of the back, shoulder, and abdominal muscles. It is probable that what was gained in girth of chest was compensated for in loss of fat, since the exercises entailed hard physical work to the children and they perspired freely. All the scholars certainly looked much better than they did six weeks previously, and there is

no doubt that the greater the number of attendances the better were the results attained.

Also, at the end of the course there was a marked improvement in the breathing and articulation of the children, and there was an absence of the facial contortions which had been so marked previously.

Three or four months later I examined several of these children again when they had returned to their ordinary schools. I found that a few had again commenced to stammer, and certainly received the impression that these would have benefitted by a prolonged course, or by another course repeated after an interval.

For example, on April 10th, E. D. was examined and found to be an extremely bad case of stuttering. His facial contortions and movements of arms when attempting to speak were extremely well marked. At the end of the six weeks' course this boy had improved beyond measure, although he retained the slow syllabic speech. When I saw him again three months later he could read very well when read with in a low gentle voice, but if he attempted to read alone he always stumbled at the letters b, s, n, and p. It occurred to me that this was the type of case which would benefit by a repetition of special tuition.

Later in the year the Blackburn Education Committee sent two lady teachers to Manchester in order that they might learn the Berquand method of treating stammering, which may be summed up as follows:—

It is a *mental treatment*, the rôle of which is to modify the natural impressionability of the stammerer, to discipline his thought, and to fortify his will and his self-control; and—

A *functional treatment*, based on a scientific and progressive gymnastic exercise of the organs of breath, voice production, and articulation, whose aim is to give strength and flexibility to these organs, and to restore the normal working of all the constituent parts of the vocal apparatus, the distorted and uncertain action of which destroys the balance of the phonetic manifestations.

Léon Berquand says that this double treatment is absolutely harmless, and, besides curing stammering, it is always found to develop the energy of the pupil and to strengthen his general constitution. His system includes the minute study of the mechanism of sounds. It is founded on the law of phonetics and on the principles of

singing, which fact will appear perfectly rational to those who are aware that stammering never occurs in singing.

Dr. Herman Gutzmann, doctor of medicine in Berlin, and specialist for the treatment of stammerers, said that experience justified him in stating:—

- (1) That only the co-operation of parents and teachers could prevent relapses in the treatment of stammering.
- (2) That, in consequence of this, teachers should be initiated in the essential rules for the treatment of stammerers, and in the precautions to be taken after the treatment.
- (3) That student teachers in the training colleges should also be prepared in view of this object.
- (4) That parents should receive verbal and printed instructions from the medical officers and teachers, not only with regard to stammering, but also to aid the normal development of speech in children before they attend school.

Berquand emphasizes strongly the possibility and the necessity of *initiating public school teachers* in the essential rules of the pedagogical treatment for stammerers in order that they may prevent and correct this infirmity.

A special class was formed under the two teachers mentioned above, in 1908, and an account of the results will appear in the next annual report.

PRIZES FOR LARGE FAMILIES.—At the Lincolnshire Agricultural Society's annual show, opened yesterday at Sleaford, prizes were offered to the agricultural labourers who had brought up and placed out the largest numbers of children, without having received parochial relief. The first prize of £4 went to George Farmery, of Hemswell, Lincoln, who had had twenty-three children, seventeen of whom were brought up, and fourteen placed out. The second prize went to John Elsey, of Lusby, near Spilsby, who had had fourteen children, fourteen of whom had been brought up, and eleven placed out. The third prize-winner was William Bell, of Croxby, Caistor, with fourteen children born, eleven brought up, and the same number placed out. The five men competing in the class had a total of seventy-eight children.

THE LATEST SCHOOL HYGIENE CIRCULAR OF THE BOARD OF EDUCATION.

THE Board of Education have recently issued an important circular to Local Education on certain questions relating to the health of school children. These questions are considered under the following heads:—

- (A) The functions of the "School Medical Officer";
- (B) Provision for Medical Inspection of school children under the Code of 1908;
- (C) The Local Education Authority's Annual Report on Medical Inspection to the Board of Education; and
- (D) Arrangements for attending to the Health and Physical Condition of School Children.

Under the first head the Board point out that the functions specially assigned to the School Medical Officer by the Code are—

- (1) Those of reporting on the working and effect of any arrangements made under Article 44 (g) for educating the children at "an open air school, school camp, or other place selected with a view to the improvement of the health and physical condition of the children."
- (2) The power of advising or approving the closure of a school under Article 45 (b).
- (3) The power of authorising the exclusion of certain children from a school on specified grounds under Article 53 (b), which grounds will be regarded as "reasonable grounds" under Article 53 (a).

The Board explain that one of the objects they had in view of introducing these provisions into the Code was to secure that the responsibility for dealing with certain medical questions connected with public elementary schools, should, as far as possible, be placed in the hands of a single officer responsible to the local education authority. The Board consider it very important that a

"single individual should be charged with the organisation and control of the whole machinery of the School Medical Service and that he should be in a position to take responsibility for the acts of all persons taking part in the work, including those of Assistant Medical Officers, School Nurses, Attendance Officers and Teachers, so far as they perform any functions in connection with the School Medical Service."

The Board, however, make it clear that they do not contemplate any infringement upon the ultimate responsibility of the local education authority.

(B) PROVISIONS FOR MEDICAL INSPECTION.

The Code now requires, as a condition of

Grant, that satisfactory provision for the medical inspection of children shall be made; and the Board state that "the best evidence of compliance with this condition would be afforded by (a) the appointment in each area of a competent School Medical Officer, and a staff of qualified and suitable assistants under his control, and (b) the initiation of a carefully considered scheme for covering the ground." For this purpose the Board require particulars of the appointments made by the local education authority, and forms upon which these particulars are to be given accompany the circular.

(C) ANNUAL REPORT.

A considerable portion of the circular is devoted to the subject of the Annual Report of the School Medical Officer, two copies of which must be sent to the Board of Education. The Board indicate in some detail the kind of information which they think it is desirable that the report should contain. It is recognised, however, that the scheme indicated by the Board suggests "a degree of comprehensiveness which in many, and indeed in most cases, will not immediately be attainable."

(D) ARRANGEMENTS FOR ATTENDING TO THE HEALTH AND PHYSICAL CONDITION OF SCHOOL CHILDREN.

The most important part of the circular is contained in this section. The Board's observations are arranged under the following heads, and in each case the Board has something of considerable importance to say.

- (a) Improvement of the School Arrangements.
- (b) Exercise of Powers under Special Acts relating to School Children.
- (c) Co-operation with the Sanitary Authority.
- (d) Advice or Direction to Parents.
- (e) The School Nurse.
- (f) Provision of Spectacles, etc.
- (g) Contribution to Hospitals, Infirmaries, Dispensaries, etc.
- (h) School Clinics.

The Board's remarks on School Clinics, which form perhaps the most important part of the circular, are given in full below.

(h) *School Clinics.*—School Clinics may serve two purposes. They may be used for further and more scientific examination of cases in which

medical inspection has indicated the existence of defects in a child which cannot conveniently be investigated on the premises of an ordinary Public Elementary School. For instance, the School Medical Officer may discover at his first inspection that a child is affected in respect of one or more of the particulars numbered 17 to 24 on the Schedule accompanying Circular 582, and it may be necessary for him to ascertain by further examination whether the child is fit to continue in attendance at a Public Elementary School, or whether any special precautions should be taken in the case of such a child if he continues to attend, or whether special provision should be made for his education in some other manner. Similarly, in the case of ocular defects, the detailed examination of the child may often be more expeditiously and thoroughly carried out at a School Clinic, where special appliances are available. So far as a School Clinic is used for such purposes, its establishment appears to fall within the scope of provision for medical inspection, but such a clinic should not be used merely for the purpose of enabling the ordinary inspection of school children to be carried out elsewhere than at the schools which they attend, nor, in ordinary circumstances, will the Board be prepared to approve, for the purpose of Article 44 (h) of the Code, attendance at a School Clinic as an inspection centre.

The establishment of School Clinics for purposes of treatment of defects revealed by inspection gives rise on the other hand to questions of considerable difficulty, and, before sanctioning the establishment of a School Clinic as an "arrangement" under section 13 (1) (b) of the Act, the Board will require to be furnished with detailed information as to the methods and scope of the work which it is proposed to do. They will, in particular, require to be informed—

- (1) What precautions the Local Education Authority will take to secure that only those children shall be treated in a School Clinic for whose treatment adequate provision cannot otherwise be made, whether by the parents or by voluntary associations or institutions, such as hospitals, or through the agency of the Poor Law;
- (2) What precise diseases and defects will be treated;
- (3) By whom and on what terms and conditions the treatment will be carried out and what will be its extent;
- (4) What is the estimated cost of clinic in respect of buildings and equipment, maintenance and administration, and treatment, and how it is proposed to meet this cost, out of the rates or otherwise.

A NEW ADULTERANT.—In a milk case heard at the Edmonton County Court on May 4th, counsel invited a dairyman witness to say that in the winter time there was a slump in milk. The witness, with energy, replied: "Slump in milk! I never put any slump in mine. If I did, I should soon have the inspector after me."—*Law Times.*

THE REPORT OF THE HOME WORKERS' COMMITTEE.

By FRANCIS J. ALLAN, M.D.

Medical Officer of Health, Westminster.

(From a Special Report).

A Bill dealing with home workers was recently before the Public Health Committee, but consideration of it was adjourned until the Select Committee on Home Work had reported to the House of Commons. This has now been done.

In the above-mentioned Bill it was proposed that the premises occupied by every home worker should be licensed twice a year by the sanitary authority, after inspection as to its sanitary condition. This method of dealing with the problem is condemned as impracticable. It would entail an enormous addition to the staff of inspectors and would place serious obstacles in the obtaining of work. The Select Committee are of opinion that much might be accomplished by far less drastic measures. Complete lists of home workers might be obtained by requiring that every home worker must register his or her name, occupation and address with the local authority, and obtain a certificate of such registration before receiving work to do at home for the first time, such certificate to remain valid until any change of residence. It could be made an offence for any employer to give out work to be done at home unless a certificate of registration were produced. No conditions as to cleanliness of persons or dwelling need be required as a condition of registration. The certificate of registration should be issued immediately the application was made, and no fee of any sort should be charged either for registration or certification. As the offices of the local authority would be the place of registration, everyone would know where they were, and they would always be accessible without delay or serious inconvenience. The aim would be to obtain complete and accurate registration. This would not supersede, but supplement, the keeping of lists of outworkers by employers.

The Committee are of opinion that it is desirable that the responsibility of supervision as to structural and domestic cleanliness, in these cases, should rest primarily with the local authority, inasmuch as these are sanitary matters and refer to dwelling houses; but

power should be given to the factory inspector to secure the enforcement of the law if the local authority failed in the performance of their duties. The recommendations in regard to this matter are summarised thus:—

(a) That all home workers who are employed by other persons in producing or preparing articles for sale should be required to register their name, address and class of work at, and receive a certificate of such registration from, the offices of the local authority, and that the keeping of accurate outworkers' lists by employers should be strictly enforced.

(b) That it should be an offence for any person to employ any home worker to produce or prepare any articles for sale by another person unless the worker produce a certificate of registration.

(c) That the provisions of Section 9 of the Public Health Act, 1875, with regard to factories and workshops which are not kept clean or are ill-ventilated or over crowded, should be extended to rooms in which home work is done, and power should be given to sanitary and factory inspectors to inspect them and secure the enforcement of the law.

The Acts affecting London appear sufficient to effect the inspection of home workers' premises and the removal of insanitary and unwholesome conditions, but there is not sufficient power to prohibit work being done in the premises until unwholesome conditions which may exist are remedied. It is desirable that powers similar to those contained in Section 110 of the Factory and Workshop Act, which gives the sanitary authority power to prohibit work being given out or carried on in premises in which there is infectious disease, should be given where serious conditions exist likely to be detrimental to the health of the workers, or where articles of clothing are liable to convey contamination by vermin, &c. Section 108 of that Act was evidently intended to deal with places likely to be injurious to the persons employed therein, but a month must transpire after the making of the order before an offender could be summoned for non-observance, and there is no means of punishing him for having exposed his workpeople to such conditions during that month, if he removes the insanitary state of affairs before the summons is heard. With good class employers giving out work it is usually sufficient to

intimate to them that a representation is to be made to the council with a view to an order being made under Section 108, but it is conceivable that there might be employers who would not act on such warning. Where this Section 108 is applied to home work, it can hardly be said that the employer "exposes" the workpeople to the insanitary conditions that may prevail in their homes, nor is it in his power to "remove the insanitary state of affairs" in premises over which he has no control. At the same time, if the conditions were so serious as to necessitate the stopping of work, it should be in the power of the council to enforce their order within a less time than a month.

Further, there is no power to require persons taking work home to give the names of those from whom they receive it. Such an employer may not have sent in a list of the persons he employs, or he may have taken on others after the date when he has to send in his list, so that the sanitary authority would not have the new names until several months had elapsed. Employers instead of sending in two lists a year, might be required to send one list at the beginning of each year, and to notify the sanitary authority at once when a new out-worker was employed or an old one changed his address.

With regard to the recommendation that home workers should register their names and receive a certificate of the same, it might be desirable to make it an offence to lend or transfer a certificate. It would be well, also, to require a home worker to return his certificate when he permanently gave up taking such work.

Recommendation (b) makes it an offence for any person to employ a home worker who has not produced a certificate of registration; it should also be an offence for an unregistered home worker to take such work. It would be difficult to prove that an employer had not seen what he believed to be a certificate.

A RETROGRADE STEP AT WEST HARTLEPOOL.—At the meeting of the West Hartlepool Council on August 11th, it was moved that all resolutions respecting the appointment of a medical officer, at £500 per annum, be rescinded; that a medical officer be advertised for at £150 per annum, but allowed private practice; and that four medical men be appointed as inspectors of school children at £50 each annually. After considerable discussion this was carried. It is to be hoped that the Local Government Board will be able to induce the council to take a more enlightened view of their public health responsibilities.

AN UNUSUALLY EXTENSIVE MILK-BORNE OUTBREAK OF TYPHOID FEVER IN JAMAICA PLAIN, MASSACHUSETTS, U.S.A.

By CHARLES HARRINGTON, M.D.,

Secretary, State Board of Health, Massachusetts.

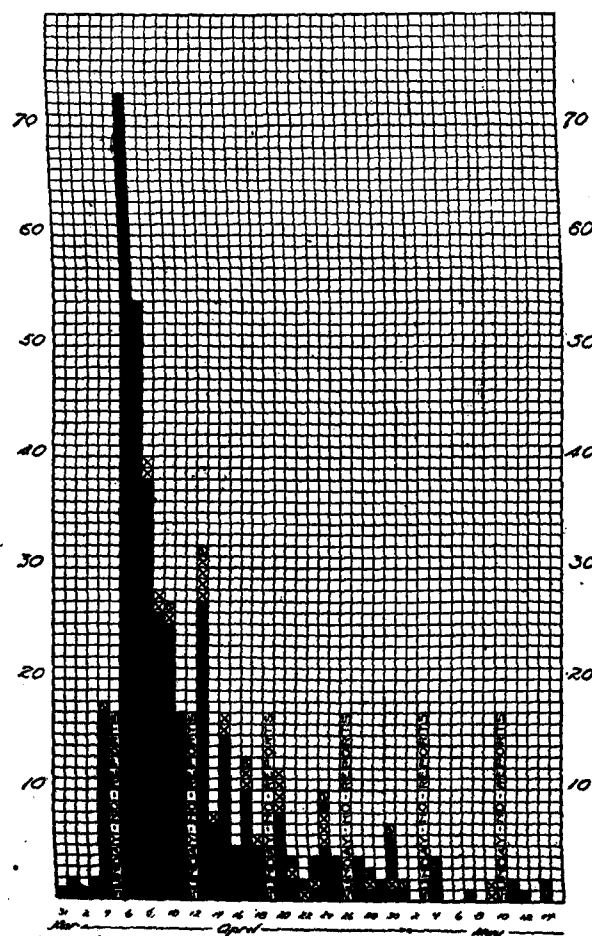
(From the Monthly Bulletin of the Board of Health, May, 1908.)

ON March 31, 1908, after several months of practical freedom from typhoid fever, a case of that disease occurred in Jamaica Plain, followed on April 1st by two more, on April 2nd by one, and on April 3rd by two. On April 4th inquiry was made as to the possibility of a common cause, and it was learned that more cases were being reported. The number reported for that day proved to be seventeen. On Monday, April 6th, the number reported was seventy-three (which number includes the cases of two days, there being no mail delivery on Sunday), and during the next five days the numbers reported were, respectively, fifty-four, thirty-eight, twenty-six, twenty-five and seventeen. From Monday, April 13th, to Saturday, April 18th, inclusive, the numbers reported were, respectively, thirty-two (Sunday and Monday), seven, seventeen, five, thirteen and five. During the next week the numbers were, respectively, twelve (Sunday and Monday), four, two, four, ten and four. Between Monday, April 27th, and May 15th the total number of cases reported was thirty, a majority of which (eighteen) were undoubtedly contact cases. There were thus reported during this period of about six weeks no fewer than 410 cases of typhoid fever, in which total are not included the cases of two persons who came into the district already ill, and a number which, in the excitement naturally caused, were wrongly diagnosed as typhoid.

So sudden an explosion, occurring in a district hitherto practically free from the disease, suggested, before it had reached its height, the probability of a common milk supply. It was learned on April 5th that twenty-three of the twenty-four cases already reported were on the routes of two milkmen. The seventy-three cases reported on April 6th, the fifty-four reported on April 7th, all but six of the rest of the cases reported during that week, and all but twelve of the cases reported during the second week were also on the same milk routes.

Of the 410 cases reported, 348 primary and twenty-three secondary cases proved to be in

families supplied by these two men, who hereafter will be designated as F and Q. Since the number of cases occurring on each route was about the same (primary, 175 and 173; secondary, six and seventeen, respectively), and for reasons which will presently appear, the two supplies are presented as one in the accompanying chart, which illustrates the characteristically explosive nature of a milk-borne outbreak. There were twenty-nine cases in which no history of the use of their milk could be obtained, and seven in which there was a possibility that the victims had on some one or another day drunk it. Those thirty-six persons were among the regular customers of no fewer than fifteen different milkmen. More than half of them were adults, who, in going about freely and perhaps lunching and dining in restaurants and in the homes of their friends, may have consumed some of the same milk, or may have ingested the infection with some other article of food; and all but three of the remainder were children of school age, who also doubtless visited about to some extent.



■ Patient drank milk of F or Q 348
 ■ No history of use of milk of F or Q 29
 ■ Secondary cases probably due to contact 26
 ■ Milk supply may have entered same from F or Q 7
 410

Age Periods.—The persons seized in this outbreak were distributed according to age as follows:—

1 to 5 years	...	...	...	...	77
6 to 10 years	...	...	...	...	75
11 to 15 years	...	...	...	...	49
16 to 20 years	...	...	...	...	42
21 to 25 years	...	...	...	...	44
26 to 30 years	...	...	...	...	34
31 to 35 years	...	...	...	...	24
36 to 40 years	...	...	...	...	25
41 to 45 years	...	...	...	...	15
46 to 50 years	...	...	...	...	9
Above 50 years	...	...	...	...	13
Age not stated	...	...	...	...	3
					410

Number of Households invaded.—The 410 cases were distributed as follows:—

Single cases in 216 households divided as to milk supply as follows:—							
F	...	...	...	...	...	...	97
Q	...	...	...	...	...	...	86
All other milkmen	...	...	...	...	...	...	33*
							216

* Including one contact.

In seventy-nine households multiple cases occurred as follows:—

2 cases	...	57 households	...	total 114; contacts 12
3 cases	...	12 households	...	total 36; contacts 7
4 cases	...	7 households	...	total 28; contacts 5
5 cases	...	2 households	...	total 10; contact 1
6 cases	...	1 household	...	total 6; —
		<u>79</u>		<u>194</u> <u>25</u>

Of the total number of contact cases (twenty-six), twenty-three occurred in households supplied by F and Q.

The Milk Supply of F and Q.—In common with eight other milkmen, Messrs. F and Q obtained their supply from the car of a contractor who derived this particular carload from eight towns, in none of which had a case of typhoid fever occurred during the previous three months, excepting that of an Italian labourer in no way connected with milk production. Each milkman who went to this car received milk from the same dairies regularly, and the fact that there was but one dairy whose product was given to both F and Q was naturally suggestive that the infective material came to Jamaica Plain from this particular dairy. Inquiry at the place of production revealed that not only was there no history there of any sickness whatever, but

also the interesting fact that the owner was marketing about sixty cans a day, only forty of which were sent to Jamaica Plain, twenty being sold daily to a dealer in another place, where there had been but one case of typhoid fever, and that one not on his route. It was evident, therefore, that the infection did not come from the premises of this producer.

Among the first victims of the disease to be reported was the milkman F himself (April 4th). It appears that on or about March 20th, F consulted his family physician, who concluded that F was merely tired and over-worked. From that time until April 2nd, F felt ill, but was able to attend to his daily work, which included the general handling of his milk. On April 1st he consulted his physician again, and at that time his temperature was 100°, and he was suffering with diarrhoea. On April 2nd a diagnosis of typhoid fever was made, and he took to his bed. On April 10th he died, and the autopsy performed by Dr. George B. Magrath revealed, among other lesions, an ulcer, 1.5 by 2 centimetres, at a point about 60 centimetres below the ileocaecal valve, which ulcer, being of not less than three weeks' development, indicates that F must have been suffering from typhoid fever as early as March 20th. Other lesions observed in the intestines—numerous ulcers of varying size—were of more recent origin, and represented, according to Dr. Magrath, the conditions found toward the end of the second week.

Considering that F had been ailing for a period of about two weeks before he took to his bed, but not to such an extent as to prevent him from handling the milk, it is not difficult to surmise in what manner the supply became contaminated with the exciting cause of the disease, for the hands of the average milkman do not receive the same degree of care as those of an operating surgeon, and with more or less frequent occasion for interrupting the work of handling the milk in order to respond to natural calls, specific contamination, first of the fingers and then of the milk, is very likely to occur.

With the supply of Q, however, the connection is by no means clear. It was reported that Q received from the dairy which they had in common only those cans which F left for him, after tasting all and selecting those which he wished for his own trade. This, however, is denied on apparently good authority, and, instead, it is said that on only two occasions, namely, March 15th and March 18th, did F

precede Q at the car. It is further stated that although each can was tasted before acceptance, those that were rejected were set aside and not delivered to Q. However this may be, and whether or not, F had an opportunity to infect the milk of Q on either of these two days or on any subsequent day, it is certain that there was the greatest possibility of an interchange of cans between F and Q, for it was the custom of each to return the cans to the car washed, but by no means sterilized; and after they were filled at the dairy and returned, Q was as likely as F to receive cans which had been supplied to and handled and returned by F. Certain it is that the first infection did not occur at the place of production and was not due to the fault of the farmer; and equally certain is it that F, during two weeks of ambulant typhoid fever, had ample opportunity to infect his supply and to re-infect it again and again, and to spread the infection to Q's supply through the non-sterilized cans of the contractor, which they used in common.

MILK AND THE MILKMAID.—Dr. Cook, medical officer for the Tendring rural district of Essex, deplors the passing of the milkmaid. "In my opinion," he says in his annual report, "the greatest misfortune that ever happened to the dairy business was the abolition of the milkmaid; she generally had clean hands, but to get the hands of the present cowman (who does all the dirty work about the place) clean is an utter impossibility." The following argument, advanced in the *North British Agriculturist* against the Access to Mountains Bill, may provide a reason for the decline of the milkmaid. A farmer, giving his objections to the Bill, said: "A lad and lass come up here coartin'. She draps hairpins aboot, a coo eats them and dees. Wha's tae pay?" The writer concludes that many farmers will not allow a woman to attend their cattle owing to the hairpins dropping among the fodder.

RURAL UTOPIA.—"The sanitary inspector reported upon his visits, and stated that he found defective outbuildings, foul privies, cottages with insufficient windows, no ash-bins and other defects. In one case a cottage with only one bedroom was occupied by a man, his wife and two girls, aged 11 and 8 years, one of them having scarletina, with no means of isolation. He had supplied the usual disinfectants, and this was all he could do. The rural district council were of opinion that the owner of the estate could not be aware of the circumstances, and that his attention should be called to it at once. In the other cases the usual orders for abatement were made."—Extract from a recent report to a Rural District Council.

THE MEDICAL INSPECTION OF SCHOOL CHILDREN IN RURAL DISTRICTS, AND ITS RELATION TO MEDICAL OFFICERS OF HEALTH.*

By J. SINCLAIR HOLDEN, M.D.,
Medical Officer of Health, Sudbury.

THERE is little doubt but that the medical profession entirely approves of the necessity for the medical inspection of school children, and only wonders that it was not adopted long ago, as many other nations have had it in operation for a long time. It is evident that compulsory education ought to imply that every child is fit to be educated, both physically and mentally, so that when the period of education is finished, they can fulfil life's duties and so repay the State for the expense incurred.

In the provisions of the Education Act of last year, medical inspection of school children is now made one of the duties of the local education authorities, and the Memorandum of November, 1907, shows that the scope of the Act is most extensive, and, even to ensure a partial measure of success, demands an equipment which it will take some years to render efficient.

The fundamental principles of the new Act are:—

- 1st.—Medical inspection of school children at regular intervals.
- 2nd.—The oversight of the sanitation of the school buildings.
- 3rd.—The prevention, as far as may be, of the spread of infectious and contagious diseases, including skin diseases.
- 4th.—Systematic supervision of the personal and home life of the child.

I will briefly refer to the position of the rural medical officer of health with respect to these four principles.

- 1st.—The medical inspection of the school children.

I am sure that under the present very imperfect conditions, the medical officer of health has neither the time nor desire, even if qualified, to undertake this duty. The

County Council, as the Education Authority, will very likely appoint whole time medical inspectors.

- 2nd.—Oversight of the sanitation of school buildings.

To a large extent this is already done by the rural medical officer of health—inspection being made of school offices, water supply, cleanliness and ventilation of class-rooms.

- 3rd.—Prevention of the spread of infectious and contagious diseases.

This is an essential part of the duty of a medical officer of health and must continue to be so.

- 4th.—Supervision of the home life of the children.

Herein lies the root of the successful working of the Act, and agencies have yet to be created to carry it out.

The Memorandum says that generally speaking the work of inspection should be supervised by the medical officer of health. I think it is much more likely to be the other way about, and that the whole time medical inspector will try to supervise the rural medical officer of health by frequently indicating his hygienic duties in connection with his school inspections.

The Memorandum referred to states that these regulations are only for providing for the initiation of the Act, and no doubt the suggested machinery for working out all the good results expected, will be subject to many modifications. It is recognised that one of the most urgent is the training of the school teacher in the principles of hygiene; this ought also to include, as most important, a practical knowledge of all the preliminary tests for children. The school teachers are a most intelligent class and are quite capable of grasping these tests. I read that in the London schools, Snellen's test types have been used for years by the teachers; also among continental nations not only vision tests but others are made. In PUBLIC HEALTH for August last, it is stated that in Massachusetts the statistics show that the work done by teachers is quite as reliable as that done by specialists, and besides that the teachers' familiarity with the children tends to relieve the examination from the excitement, which is sure to attend the examination by a stranger.

Without interrupting school work, the teacher could keep a register of the height and weight of every child, noting any defects in sight, hearing, breathing, mental and physical condition, so that when the medical inspector calls, he need only specially inspect the defective children, and these would be very few, as the children in our rural schools are generally the picture of health.

That such modifications of the Act will be allowed, once teachers are trained, is very likely, and under such circumstances, I consider that the first three directions of the Memorandum could be best undertaken, in rural districts, by the medical officer of health becoming the medical inspector of school children.

With regard to the fourth direction, for the supervision of the home life of neglected children, I would certainly make use of the district and maternity nurse, who is now becoming established in most rural parishes. These nurses have generally two or three schools in their district, and given some extra remuneration, could easily become both school nurses and health visitors, co-operating with the teachers and the medical officer of health in the supervision of the hygienic condition of the home life of neglected children.

On these lines I consider that the medical inspection of school children, in rural districts, could be more efficiently carried out by the medical officer of health than by a whole-time inspector; besides it could be done more economically, which must be a consideration to the education authorities, as the expense, owing to the state of the Imperial Exchequer, is certainly to be borne by the local taxpayer.

INSANITARY STRUCTURAL DEFECTS ON NEW VESSELS.*

By J. HOWARD-JONES, M.D., D.Sc., C.M.,
Medical Officer of Health, Newport.

IN previous reports I have drawn serious attention to the gross mistakes in the accommodation provided in some new vessels, in spite of the supervision of the Board of Trade.

July 19th, 1907. A steamer arrived at Newport on her maiden trip straight from the builder's hands on the Clyde.

The forecastles provided accommodation for three men on either side. The Board of Trade require a certain amount of free floor space per

head. This was provided, but a good part of it consisted of acute angular spaces, too narrow for any practical use, which contravened the requirements in spirit. The forecastles formed a well about four feet below the level of the deck from which it was approached by steps. The ship's side formed the larger portion of the walls of each fore-castle—this consisted of bare iron walls which, in certain conditions of temperature, etc., stream with moisture owing to condensation.

The floor drained into a well with a wooden cover, and provided with a hand pump; this well also received the drainage from the chain lockers, which drainage consisted of the filth from the anchor chains picked up from the bottom, etc., of docks! On examination, this well was found to be full of a black stagnant fluid.

The chain receptacles or lockers were in the forecastles and extended from floor to ceiling; each consisted of a wooden structure with open joints. The fermenting and offensive contents of these lockers would therefore ventilate into the forecastles; nevertheless four midship's bunks were placed against these chain lockers.

The men's provisions were placed in lockers at the ends of their bunks, in narrow recesses, in the eyes of the fore-castle. Even under the best of conditions the storing of perishable foods in sleeping and living apartments cannot but be regarded as a grave breach of the laws of domestic hygiene; but in this instance the food had in addition to be stored amid foul emanations from dock water and mud and the drainage from the floors of the forecastles.

The structural defects were not, however, confined to the crew's spaces.

The chief engineer's cabin on the port side, and the second engineer's and cook's cabins on the starboard side were amidships adjoining the engine room, and separated from the latter by iron bulkheads. They were entered by doors opening from the engine room, and, therefore, were supplied with hot moist air from the engine room, in which the ends of the boilers were exposed.

Behind, or aft, the quarters of the second engineer and cook was the galley, with its cooking stove, which was placed against the partition separating it from the said cabin. The heat from the stove was so great that the paint in this cabin had already been blistered by it.

* A Paper read at the Annual Meeting of the Eastern Counties' Branch, on July 18th, 1908.

* From the Annual Report to the Newport Port Sanitary Authority, 1907.

Such examples surely form a serious indictment against the authorities responsible for permitting insanitary conditions of the kind to be perpetrated in new vessels.

Inspector Roberts has drawn attention to the insanitary methods of storing food obtaining on vessels carrying Lascar crews. The custom is to hang the meat, and store rice, dried fish, flour and other edibles, in the fore-castles, which are frequently occupied by thirty or forty or more men, both as living and sleeping apartments; these quarters also contain casks, boxes, etc., in addition to the men's bunks, so that under such conditions it is extremely difficult to keep them clean.

Fresh water tanks or casks are also kept in such fore-castles; these are oftentimes in a filthy condition.

TUBERCULOSIS IN GUERNSEY CATTLE.*

By H. DRAPER BISHOP, M.D., M.R.C.S., L.R.C.P.,
Medical Officer of Health, Guernsey.

THE publication of the second interim report of the Royal Commission upon Tuberculosis in 1907 has only confirmed previous knowledge and brought no new facts to light.

Although there are slight differences between human and bovine tubercle bacilli, these are relatively unimportant, and the broad facts remain that human beings develop tuberculosis from bovine bacilli, and cattle from human bacilli.

We must now consider a question of more than ordinary interest to our community, the relation of tuberculosis to Guernsey cattle.

The Guernsey cow is well known, not only for the abundance and rich quality of its milk, but for its freedom from tuberculosis. It has always been kept pure in breed, no intermixture with any other strain having been allowed.

No animal which had left the island was ever allowed to return unless conveyed at once to the State's abattoir and there slaughtered, the only exception to this rule being in the case of cattle sent away for exhibition purposes. It is difficult to imagine the reasons which led to this exception being allowed, but the recent Ordinance is a wise reversion to former practice and entirely forbids it.

The chief export trade of Guernsey cattle

has been to the United States and Canada, where the breed was highly esteemed, and the veterinary experts of these countries, after testing large numbers of them with a negative result, came to the conclusion that they were immune from tuberculosis, and so allowed them to be shipped without being tested. This was the position until the autumn of 1906, when, like a bolt from the blue, came the news that some animals which had been shipped to the United States had been found to be tuberculous shortly after being landed there.

The United States Inspector then stated that he had received instructions from his Government to test all animals before shipment, and added that in his opinion the disease had been introduced into the island by means of cattle sent to English shows, afterwards returning to Guernsey.

Inquiries showed that although other animals of the suspected herd had been affected with tuberculosis, no other herd in the island had been affected.

The Royal Court promptly passed a drastic Ordinance dealing with bovine tuberculosis and forbade the importation of cattle which had been sent away for exhibition purposes.

In spite of the wholesale testing of cattle by the United States and Canadian Governments' inspectors since this date, no animal has been found to re-act to the tuberculin test.

A comparison with the results of similar testing amongst cattle in England is most significant. During the hearing of a recent case in the English Law Courts, Professor MacFadyen stated that there was abundant evidence to prove that in England not less than 20 per cent. of the adult cattle were affected with tuberculosis to some extent; and Mr. Wm. Owen Williams, F.R.C.V.S., veterinary surgeon to H.M. the King, stated that he knew that thirty-six out of the forty cows belonging to the late Queen Victoria were tuberculous. No animal out of the last 1,000 cattle bred and reared in Guernsey, which has been killed in the State's abattoir, has been condemned on account of tuberculosis, and every carcass has been examined by the State's Veterinary Inspector, Major G. D. Whitfield. These statements show how remarkable is the immunity from tuberculosis of Guernsey cattle, and even if they had no other good qualities to recommend them, the breed should be even more highly prized than it is at present.

* From the Annual Report on the Health of Guernsey, 1907.

COMBINED DRAINAGE.

MR. A. POWEL COKE, the chief clerk in the St. Pancras Public Health Department, has prepared a report on combined drainage, with special reference to the Metropolitan Sewers and Drains Bill, 1908. This Bill is the outcome of two conferences of the metropolitan sanitary authorities which were held at the St. Pancras Town Hall, the first on June 24th, 1907, the second on December 6th, 1907. Since the case of *Travis v. Uttley*, local authorities in London and in the provinces have been to heavy expense in the repair of drains, which, by a legal technicality, have become "sewers." Mr. Coke has prepared a table showing the cost incurred by the metropolitan authorities since 1899, but he points out this table does not give the whole expenditure, because in some boroughs the cost under the head of combined drainage has not been separated from the cost of the general maintenance of sewers. The table is as follows:—

SUMMARY OF AMOUNTS PAID IN REPAIRING OR RECONSTRUCTING SEWERS DUE TO COMBINED DRAINAGE BY THE

METROPOLITAN BOROUGH COUNCILS.

	1899-1900	1900-1	1901-2	1902-3	1903-4	1904-5	1905-6	1906-7	1907-8	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Battersea ...	2427 15 3	3151 0 5	1629 2 5	2348 4 10	2876 13 2	2127 0 0	1878 0 0	1405 0 0	1117 0 0*	18954 16 1
Bermondsey	Average expenditure £250		per annum.	No separate account kept						2423 0 0†
Bethnal Green	1150 8 6	1399 17 7	1125 19 5	2609 12 2	2741 3 9	1943 8 8	1997 13 5	1296 18 7	1237 15 0	15502 17 1
Camberwell...	1436 0 0	2200 0 0	1308 0 0	700 0 0	900 0 0	1200 0 0	800 0 0	525 0 0	400 0 0	9469 0 0
Chelsea	—	—	50 6 0	98 16 0	—	Nil	16 0 0	16 0 0	53 13 6	234 15 6†
Deptford	—	—	Total for years 1900-1904:	182 6 5	128 8 2	10 14 5	30 7 10	30 10 8	850 7 6†	
Finsbury	Not available	33 0 0	32 8 11	15 0 0	15 0 0	69 0 0	81 0 0	127 0 0	412 8 11†	
Fulham	1020 9 1	407 8 0	1304 8 10	450 11 7	523 0 7	326 8 2	287 4 6	222 19 11	260 13 0	4808 3 8
Greenwich	—	—	—	Approximate expenditure 1904-1908:	257 13 10	Nil	Nil	Nil	257 13 10†	
Hackney	Approximate expenditure £3000 per annum.									27000 0 0*
Hammersmith	142 1 5	191 19 9	210 7 4	102 2 11	110 4 8	80 16 11	56 9 5	59 5 5	127 19 8	1931 7 6
Hampstead	—	—	—	200 0 0	150 0 0	100 0 0	82 0 0	87 0 0	Nil	519 0 0†
Holborn	—	—	—	—	Nil	Nil	Nil	No separate account kept	—	
Islington	3850 0 0	2852 5 3	3930 3 3	4877 12 2	4513 9 1	2995 0 0	4832 0 0	4369 0 0	2075 0 0	33794 9 9
Kensington	—	—	—	180 15 4	24 0 0	59 0 0	10 0 0	111 13 1	Nil	335 8 5†
Lambeth	—	—	—	1184 4 7	1590 6 0	549 17 5	540 19 2	1105 0 11	1300 0 0*	6270 8 1†
Lewisham	—	Estimated expenditure for years 1900-1904:	1000 0 0	1000 0 0	753 18 0	1075 0 10	1033 14 8	481 9 7	11114 5 6	
Paddington...	2361 0 0	1754 0 0	1784 0 0	1367 0 0	1114 0 0	871 0 6	871 0 6	871 0 6	1036 2 10	11928 13 11
Poplar	1265 3 4	1575 0 2	1318 11 10	1870 8 8	1447 17 4	1096 19 6	1075 0 10	1033 14 8	481 9 7	11114 5 6
St. Marylebone	No separate account kept.	—	—	—	7 14 0†	38 0 0†	No separate account kept	—	—	42 14 0†
St. Pancras	1931 12 9	4209 14 2	3512 3 7	5361 8 0	4001 12 4	1998 17 5	1458 3 1	546 1 7	24506 15 7	
Shoreditch	701 11 8	576 10 11	381 14 6	592 17 2	435 6 2	468 7 1	318 6 4	460 0 0	460 0 0*	4414 13 10*
Southwark	—	—	1066 15 5	760 7 11	1160 2 4	711 4 1	877 6 2	1079 5 8	600 0 0*	6255 1 7†
Stepney	—	—	774 19 1	815 8 1	740 5 5	1236 18 5	1229 7 9	1466 2 2	2178 14 8	8442 0 7†
Stoke Newington	—	—	53 0 0	—	Unable to give figures.	—	191 12 11	182 8 10	185 0 0*	612 1 9†
Wandsworth	Nil	186 8 11	134 2 10	514 19 10	178 8 2	175 11 7	70 19 5	Nil	86 6 10	1346 17 7
Westminster	Estimated expenditure £250 per annum.			—	—	—	—	—	—	2250 0 0*
Woolwich	1220 7 0	332 3 0	879 11 4	1256 12 0	500 11 7	399 9 6	256 16 11	113 1 9	358 7 5*	5315 10 6

* These figures are approximate. † Incomplete total. ‡ Contributions to owners towards repair or reconstruction of combined drainage.

Several provincial authorities and one metropolitan borough—Woolwich—have secured legislation which relieves them from the obligation to maintain "drains" as "sewers," and at the St. Pancras conferences a Bill was drafted to obtain this result for the whole of London.

Immediately after the second conference, a circular letter, accompanied by the Bill as amended, was forwarded to the local authorities of London for approval. To this letter replies were received, and the approval of twenty-six metropolitan authorities, including the City of London, was obtained.

Subsequently, a further circular was sent out to the borough councils, stating that the executive committee were most desirous of obtaining the active assistance of the metropolitan Members of Parliament in the promotion of the Bill, and asking them to communicate with the Parliamentary representatives of their boroughs, with the view of obtaining their assent to their names being placed on the back of the Bill, and their promise to ballot for a place, so as to secure an early reading for the Bill.

This appeal met with a ready response, and the consent of twenty-eight London Members was obtained to their names appearing on the back of the Bill.

It was subsequently found, however, that, in consequence of a rule of the House of Commons, the number of backers must be limited to twelve. A selection had therefore to be made, and this was done with two objects in view—(1) to equalize the political parties; and (2) to distribute the names amongst as many boroughs as possible.

The Bill was introduced into the House of Commons on March 5th by Mr. W. H. Dickinson, M.P., and was read a first time.

The Bill is set out below *in extenso* :—

METROPOLITAN SEWERS AND DRAINS BILL.

MEMORANDUM.

The object of this Bill is to amend the state of the law relating to combined drainage.

There are two kinds of combined drain, the "combined drain" which in law is a "drain," and the "combined drain" which in law is a "sewer." The former is repairable by the private owner, the latter by the public authority.

In the opinion of builders, owners, and local authorities, combined drains were originally constructed as drains, and were mutually regarded as such until the retrospective case of *Travis v. Uttley* (1893), the effect of which has been to convert thousands of drains, which had been privately owned and privately maintained, into sewers vested in the local authorities, and maintainable at the expense of the ratepayers.

The state of the law has been described by the Lord Chief Justice, who said in a recent decision : "It seems to me, as I have before pointed out, to be essential that there should be some amendment of the law upon this subject. The state of the authorities is such that it appears to be impossible either to reconcile the various decisions or to deduce from them any logical rule."

Several provincial authorities, notably West Ham, Croydon, Carlisle, Leyton, Wood Green, Sheffield, etc., have been successful in obtaining the powers which the metropolitan local authorities ask for by this Bill.

[8 Edw. 7.]

METROPOLITAN SEWERS AND DRAINS.

A Bill to Amend the Metropolis Management Acts with respect to Sewers and Drains.

Be it enacted by the King's Most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :—

1. In and for the purposes of the Metropolis Management Acts, 1855 to 1899, and the Public Health (London) Act, 1891, or any Act or Acts amending the same, the word "drain" shall be

deemed to include any sewer or drain, whether constructed before or after the passing of this Act, with which two or more houses, buildings, or premises are, at the date of the passing of this Act, or may at any time thereafter be connected, or which is used or capable of being or intended to be used for the conveyance of the drainage of such houses, buildings, or premises directly or indirectly to any sewer which has been approved as such by the Metropolitan Commissioners of Sewers, the Metropolitan Board of Works, or the London County Council, but shall not include any sewer so approved as aforesaid.

2. This Act may be cited as the Metropolis Management Amendment Act, 1908, and shall be construed as one with the Metropolis Management Act, 1855, and the Acts amending the same.

Mr. Coke gives the following account of the progress of the Bill :—

The Bill has been down for second reading in the House of Commons on numerous occasions, but no progress has been made. To some extent this is due to the fact that it is very difficult and well-nigh impossible for a private Member successfully to legislate without the co-operation of the responsible Minister of His Majesty's Government. Accordingly, a letter was addressed to the borough councils, asking them to communicate with the President of the Local Government Board, impressing upon him the desirability of the Government taking charge of the Bill, or granting facilities for its passage into law during the present Session of Parliament. It is satisfactory to say that almost all the borough councils made representations to the President on these lines. No promise has actually been received, but the attitude of the President to the subject may be presumed from the answer he gave to a question which was addressed to him in the House of Commons on April 30th, 1907, by the Member of Parliament for Fulham. The question and answer are as follows :—

Mr. Timothy Davies.—To ask the President of the Local Government Board whether he is aware of the expense imposed upon sanitary authorities in regard to combined drainage, to some extent as the result of the decision of the Court of Appeal (*Silles v. Fulham* Borough Council); whether he is aware that the cost to the ratepayers of London alone is over £40,000 per annum to maintain such drains, and, in view of that, will he bring in a Bill to amend the law so that dishonest builders and houseowners are no longer able to surreptitiously connect the drains of two or more houses, thereby throwing the cost of maintaining purely private drainage from their own shoulders to those of the ratepayers, and, if he is not prepared to bring in a Bill himself, will he give his support to a Bill if brought in by a private Member on behalf of the Metropolitan Borough Councils.

Mr. John Burns : I have received representations to the effect stated in the question. The subject is one of difficulty, and I could not give any pledge to propose legislation with regard to it this Session. I am ready to consider any measure which may be introduced on behalf of the borough councils for dealing with the matter, but, of course, I could not say beforehand that the Bill will be one which I could support.

At this stage it may not be out of place to recall

that on June 18th, 1903, Mr. Long, the President of the Local Government Board, in reply to a large deputation from the metropolitan borough councils, admitted the necessity for legislation dealing with the question of combined drainage. The following remarks have been extracted from his reply to the deputation :—

There is no dispute whatever as to the facts, I might almost say, the ridiculous condition of things which has arisen. I suppose there is an answer, but I cannot imagine what it is to the case . . . where one pair of houses adjoining another, both apparently similar in all respects, in one case the drainage has to be paid for by the local authority, and in the other by the owner. What answer is to be given in justification of such a curious anomaly I do not pretend to know.

It also seems to me that in regard to a sewer which the local authority have to maintain, they ought to be masters both as to the situation of a sewer, the construction of it, and everything connected with it, before they should be called to be responsible for it, much less to be responsible for its maintenance. Therefore, you have made out a strong case to-day . . . I recognise to the full the existence of a very serious difficulty, but I recognise the justice of your demand, that it is one which could be only remedied by the intervention of the Government, and it would be utterly ridiculous for any one of the Metropolitan Boroughs separately to introduce a Bill, and I also entirely agree . . . that it is extremely difficult and almost impossible for a private Member to legislate. Therefore I fully accept the situation as you have presented it to me to-day, and I ask you to be content with that assurance and with my further assurance that I will give to the solution of it my most careful and earnest consideration.

Notwithstanding this assurance, nothing was done by the late Government, nor has anything been done by the present Government, to give effect to the desires expressed by the deputation, that the ratepayers of London should be relieved from a burden that is felt to be unjust as well as intolerable.

PRESENTATION TO A LINCOLN DOCTOR.—An interesting ceremony took place at Lincoln on July 16th, when Dr. Charles Harrison, J.P., for many years medical officer of health for the city, was made the recipient of a handsome gift at the hands of the members of the Lincolnshire Medical Benevolent Society in recognition of thirty years' valuable services to the society. Dr. Harrison is the oldest member of the society, to which he was elected in 1861. He was appointed its secretary in 1878, and carried on that work very successfully until 1892, when he took up the treasurership, being succeeded as secretary by Dr. W. A. Carline, both gentlemen still holding these positions. The present consisted of a very handsome silver fruit stand, beautifully engraved and bearing the inscription, "Presented to Dr. Charles Harrison by members of the Lincolnshire Medical Benevolent Society in recognition of his valuable services during the past thirty years; honorary secretary 1878 to 1892, and honorary treasurer 1892 to 1908." In acknowledging the gift, which was formally handed to him by Dr. R. Tuxford, the recipient made reference to the utility of the society.

COMBINED DRAINAGE.*

By G. F. McCLEARY, M.D., D.P.H.,
Medical Officer of Health, Hampstead.

IN many of the metropolitan boroughs, considerable sums of the ratepayers' money are expended every year in the repair of combined drains, which by a legal technicality have become "sewers," for which the ratepayers are responsible. In Hampstead, fortunately, no loss of public money occurred in this way during 1907. Many claims were made, but all were successfully resisted.

In two cases the claimants carried the matter to the courts before they could be convinced that their claims against the council could not be maintained. Both these cases call for special mention, as each raised a point of unusual interest. The first case was heard at the County of London Sessions on July 12th, before Mr. Robert Wallace, K.C., and the other justices. It was an appeal against a conviction by Mr. Plowden, who found that the combined drain at Nos. 11 and 13, Birchington Road, was defective and a nuisance, and made an order on the appellant to abate the nuisance. Mr. H. Courthope-Munroe, who appeared for the council, stated that the facts, about which there was no dispute, were as follows :—In July, 1878, two applications, accompanied by plans, were made by Mr. Yerburch, a builder, to the Vestry of St. John, Hampstead, to drain, at his own expense, and in accordance with the regulations of the vestry, two groups of six houses each in Birchington Road. The first application related to six houses that were shown to drain by a combined operation into the brick sewer in Mutrix Road, which runs at right angles to Birchington Road; the second related to six houses that were shown to drain similarly into the brick sewer crossing Birchington Road. The surveyor to the vestry reported on these two applications, and stated that, although the rule was to drain each house separately and directly into the sewer, an exception could in the present case be made with advantage, because the proposed system excluded all drains from the interior of houses, and at the same time did not lessen their efficiency. The vestry accordingly made their order by passing a resolution that the surveyor's report be approved and adopted. The first application, as has been said, showed six houses in Birchington Road, draining by a combined drain into the sewer in Mutrix Road, but it appeared that, in carrying out the work, only two of these houses, namely, Nos. 11 and 13, the houses concerned in this case, were drained in this way, and that the remaining four houses had been drained in the opposite direction into the main line of sewer crossing Birchington Road. Mr. Munroe contended that the test to be applied in matters of this kind was this : Had the work which was in fact done, as distinguished from that which was authorized, thrown any additional burden of drainage upon the pipe in question? If not, then the pipe remained a drain and not a sewer. Mr.

* From the Annual Report on the Health of Hampstead, 1907.

Poley, who appeared for the appellant, contended that the fact that only two houses drained into the sewer in Mutrix Road, whereas the plan, as sanctioned, showed that six houses should so drain, constituted a material deviation from the order of the vestry, and therefore that the pipe in question was a sewer, although he admitted that the pipe had no added burden of sewage to carry in consequence of this deviation, but that, on the contrary, it had a less burden to carry than it would have had if the order had been strictly complied with.

The learned chairman, in giving judgment, said that the order of the vestry, so far as it concerned the first two houses in question, had been complied with, and therefore the pipe was a drain and not a sewer. If the remaining houses had never been built, it could not be contended that the pipe thereby became a sewer, and the position in this case was exactly similar. He agreed that the true test was that suggested by Mr. Munroe, viz., that in the absence of any increase in the burden of sewage on the pipe, it became and remained a drain and not a sewer. The appeal was, therefore, dismissed with costs, the learned chairman refusing to state a case for the High Court.

The second combined drainage case in which the council was concerned in 1907 was heard at the Hampstead Petty Sessions on December 4th. In this case the council made a complaint against the owners of the stables in the rear of Lested Lodge, and forming a part of Weatherall Stables, Christ Church Road, for allowing the drains of the stable to be in a defective condition. The defendants admitted the defects, but alleged that the pipe in question was not a drain, but a sewer for which the council was responsible. When Weatherall Stables (of which the premises formed a part) were originally built and drained, they undoubtedly formed one house structurally, and were in one occupation. Some years later various internal alterations were carried out, and the stables were divided into two by the blocking up of an internal door, and they then were separately occupied and in different ownerships. The pipe that drained the portion of the stables in question carried also the drainage of the remaining portion of the stables, and the defendants contended that these portions were separate buildings, and that the pipe was a sewer as defined by the Metropolis Local Management Act, 1855. It was contended by Mr. Turner, on behalf of the council, that the whole of Weatherall Stables formed one building only, and the cases of *Humphrey v. Young* and *Hedley v. Webb* were quoted in support of this view. The justices decided in favour of the council, and made an order on the defendants to abate the nuisance. This case was not taken to a higher court.

THIRTY-FIVE YEARS' SERVICE AS MEDICAL OFFICER OF HEALTH.—Dr. Charles Marshall Kempe, who recently resigned his post as medical officer of health of Shoreham, a post he had held continuously for thirty-five years, was, on August 4th, presented by the Shoreham Urban District Council with an illuminated address in recognition of his services to the district.

THE ADMINISTRATIVE CONTROL OF PULMONARY PHTHISIS IN SCOTLAND.*

In our last Report we referred at some length to the important question of the administrative control of pulmonary phthisis, and in the Circular which we issued on 18th March, 1906, it was pointed out that pulmonary phthisis is an infectious disease within the meaning of the Public Health (Scotland) Act, 1897: that the sections of that Act, applicable to other infectious diseases are equally applicable to pulmonary phthisis, and that the obligation resting on the local authority to deal with and control infectious diseases, extends to pulmonary phthisis. As pointed out in the preceding paragraph, the objection to the application of all the sections of the Public Health Act of 1897, had been removed by the passing of the Public Health (Scotland) Amendment Act of 1907.

It was further pointed out in our circular of 10th March, 1906, that for the effective application of the Public Health Act to pulmonary phthisis, a system of notification is essential. We were gratified to learn from time to time of the adoption of systems of notification of phthisis by various local authorities throughout the country. The following lists show that compulsory notification has been adopted by nine local authorities, and that voluntary systems of notification have been adopted by 57 local authorities. In the first list it will be observed that the City of Edinburgh has extended the Infectious Diseases (Notification) Act permanently to pulmonary phthisis, while the large populous districts of Lanarkshire will have compulsory systems of notification for at least five years. It is also satisfactory to note that in the majority of cases where voluntary systems have been adopted, the usual notification fee of 2s. 6d. is paid to medical practitioners.

List 1.—Showing Local Authorities that have extended the Infectious Diseases (Notification) Act, 1889, to include Pulmonary Phthisis.

Local Authority.	Period of Extension.
Edinburgh Burgh ...	Permanently.
Brechin Burgh ...	Do.
Penicuik Burgh ...	Do.
Lower Ward, Lanark...	Five years.
Middle Ward, Lanark...	Do.
Upper Ward, Lanark...	Do.
Cupar Burgh†... ..	One year.
Batigate District ...	Do.
Linlithgow District ...	Do.

† Have since extended Act for another year.

* From the Annual Report of the Local Government Board for Scotland, 1907.

List II.—Showing Local Authorities that have adopted Voluntary Systems of Notification of Pulmonary Phthisis, together with the fee paid to Medical Practitioners for each Notification.

District Local Authorities.	Fee.	Burghal Local Authority.	Fee.
Aberdeen District ...	2/6	Airdrie	Nil.
Alford "	"	Anstruther Easter "	"
Deer "	"	Ayr	2/6
Ellon "	"	Bo'ness	1/-
Turriff "	"	Buckhaven ...	Nil.
Ayr "	"	Camonstrie ...	2/6
Carrick "	"	Crail	Nil.
Kilmarnock " ...	"	Dundee	2/6
Northern Ayr " ...	"	Elgin	"
Clackmannan County "	"	Falkirk	"
Annan District ...	"	Gourock	Nil.
Elgin County	"	Govan	2/6
Cupar District ...	"	Greenock	"
Dunfermline District "	"	Grangemouth ...	"
Kirkcaldy "	"	Helensburgh ...	Nil.
St. Andrews " ...	"	Inverleithen ...	2/6
Aird "	"	Inverness	"
Inverness "	"	Leith	Nil.
N. Dist. Kirkcudbright "	"	Milngavie... ..	"
S. "	"	Montrose	"
W. "	"	Musselburgh ...	"
Highland Dist., Perth "	"	Partick	2/6
Central "	Nil.	Port-Glasgow ...	Nil.
Perth "	"	Renfrew	2/6
Upper Dist., Renfrew "	2/6	Rothsay	Nil.
Lower "	"	St. Andrews ...	2/6
Machars,, Wigtown "	"	Selkirk	Nil.
Rhins "	"	Stirling	2/6
		Tayport	Nil.

The population of the areas in which compulsory notification is in force, equals 14.4 per cent. of the total population of Scotland, and the population of the areas where voluntary notification is in force equals 26.9 per cent. of the total population of Scotland. That is to say, over 41 per cent. of the people in this country are already under a system of notification so far as pulmonary phthisis is concerned.

Since the issue of our Circular, the question as to the isolation and treatment of phthisical cases has received considerable attention, not only from various local authorities throughout Scotland, but also from many philanthropic persons who are most anxious to assist in stamping out this fatal disease.

In 1904 the Local Authority of the Burgh of Leith agreed to isolate cases of phthisis in spare wards at their infectious diseases hospital, East Pilton, and in the following year the district committees in Lanarkshire utilised for the same purpose the spare wards of the various infectious disease hospitals throughout the county. The results of these experiments have been satisfactory, and it is gratifying to us to learn that several local authorities are proceeding, or are about to proceed, on similar lines. In one or two instances, such as Kirkcaldy and Partick Burghs, small sanatoria are being erected in the grounds of the burgh infectious diseases hospitals. We also welcome and appreciate the assistance rendered by many private individuals in providing well-equipped sanatoria for the use of the people in certain counties in Scotland. Quite recently the Seaforth Sanatorium, beautifully situated on the Brahan estate, above Maryburgh, about 1½ miles from Dingwall, was formally opened by the donors, Colonel and Mrs. Stewart Mackenzie, of Seaforth, for the reception of cases from the County of Ross and Cromarty. Inverness-shire will also be well served by the sanatorium erected last year at Aberchalder, near Fort-Augustus, by funds subscribed by the Honourable Margaret Fraser, of Lovat. Another fortunate county is Argyllshire. Through the generosity of a lady and gentleman, a sanatorium is being erected on the Benvoullus Estate, near Oban, for the use of the whole county. Further information as to the action taken by certain local authorities in connection with the isolation and treatment of phthisical patients, will be included in a memorandum which we intend to issue on an early date, on the subject of the administrative control of pulmonary phthisis.

We were consulted by a local authority regarding a case of phthisis in this district. The patient was a young man, resident for some time in a private sanatorium, where he had been sent by a voluntary fund committee. He had been discharged considerably improved, but unfit for manual labour. A shelter belonging to the voluntary committee was put at the disposal of the patient, but further assistance in the way of food, medicine, etc., was necessary. The local authority's attention was drawn to the matter, and they agreed to apply for our consent in terms of Section 66 (1) (d) of the Public Health Act, to the supply of medicines and medical attendance for the patient. The local authority also asked whether the word "medicines" may reasonably be construed to include "food" in a case of this kind. We replied that on the interpretation we have put on the above Section, our consent is not required in an individual case, such as the local authority had presented, and further, that in the treatment of a case of phthisis, we are of opinion that medicine must be held to include such food as may be specially presented.

VITALITY OF THE TYPHOID BACILLUS IN RAW RIVER WATER.*

THE monthly and annual reports of Dr. Houston contain a large amount of original and important matter bearing upon the bacteriology of water. The report under consideration, recently issued, is, however, the first report on research work directly published as such, and we hope it will be followed by others on this and kindred subjects.

The investigation was concerned with the vitality of the typhoid bacillus in artificially infected samples of *raw* Thames, Lea, and New River waters, six separate experiments being conducted with water from each source. These waters were not of a high degree of bacterial purity, containing typical *B. coli* in as little as 1 c.c. in about half the samples.

The number of typhoid bacilli added varied from forty to eight millions per c.c. of the infected water, while either one strain or a mixture of strains were added, as many as twenty-seven typhoid strains being added in three of the experiments. The inoculated waters, in amounts of 4,000 c.c. for each, were placed in large stoppered bottles and were kept in the laboratory in the dark.

The number of typhoid bacilli was initially determined by plating on malachite green lactose bile salt neutral red peptone agar. The determinations were made weekly, after shaking up the deposit which had settled at the bottom of the bottles.

The quantitative determinations with this medium ceased when no typhoid bacilli could be found in 1 c.c. of the infected water. They showed that the decline in the number of typhoid bacilli was especially rapid during the first week. In practically all the eighteen experiments the reduction was over 99.9 per cent.

In addition to these determinations, a variety of methods and of media were employed in order to make as certain as possible that the typhoid bacillus would be isolated if it were still alive.

With these methods, in all the eighteen experiments, both when 1 c.c. and 10 c.c. of the water were examined the results were negative in eight weeks. Even when 100 c.c. were examined, in sixteen experiments no bacilli were found at the end of eight weeks, while all were negative in nine weeks.

Taking the examination of 100 c.c. as the final guide as to the presence of the typhoid bacillus, in all eighteen experiments, the bacilli were found at the end of one, two, three and four weeks, they were absent in four in five weeks, the proportion

of negative findings increasing until the results recorded above were obtained.

The results of the weekly examinations of 1 and 10 c.c. of the water yielded a similar but rather more rapid decline, showing that a fairly regular diminution in the number of the bacilli was taking place.

These investigations show clearly that, *under the conditions of the experiments*, the typhoid bacilli present declined very rapidly, but were not completely eliminated until at least nine weeks from the time of their addition to the water.

These experiments upon the vitality of the typhoid bacillus in raw river water were carried out with special reference to the question of the safety to be derived from storage, and Dr. Houston draws a number of deductions in this connection. He points out that this rapid and marked decline in the number of typhoid bacilli is paralleled and can be fairly definitely estimated by the corresponding decline in the number of excrementitious bacteria, a determination which can be made with reasonable facility. Moreover, although river water may vary in character from day to day, or even from hour to hour, large storage reservoirs have such a remarkable "levelling" effect that from the examination of even occasional samples of stored water a trustworthy judgment may be found as to the uniformly "safe" quality of the water reaching the filter-beds.

Dr. Houston concludes that it is possible to determine with reasonable accuracy, whether the water being used for filtration purposes has been stored antecedently for such a length of time as to give relative (if not absolute) assurance that any harmful properties it may originally have possessed have been destroyed in the process of storage.

So far is he satisfied with the beneficial action of storage that he adds "it is not impossible that the additional 'safety' conferred by *adequate* storage may come to be regarded as a reasonable pretext for filtration through mechanical filters, at specially rapid rates."

Dr. Houston further concludes that the advantages accruing from even a few days' storage may be so material that, exceptional cases apart, the use of *raw* unstored river water for filtration purposes should strongly be deprecated. Although, as a counsel of perfection, a water should possibly be stored for one or two months, storage for four weeks may, perhaps, in the present state of our knowledge, be regarded as affording a sufficient margin of safety.

The report contains full particulars of the bacteriological methods and results in a series of addenda, also a review of the work upon the same subject of Jordan Russell and Zeit in America, and it is a valuable contribution as to the value of storage as a means of diminishing the potential harmfulness of raw waters.

* First Report on Research Work. By Dr A. C. Houston, Director of Water Examinations, Metropolitan Water Board.

PROPOSED NOTIFICATION TO TRADESMEN OF THE RESULTS OF ANALYSES MADE UNDER THE SALE OF FOOD AND DRUGS ACTS.*

By JOSEPH PRIESTLEY, B.A., M.D., D.P.H.,

Medical Officer of Health, Lambeth.

THE Lambeth Council, on June 13th, 1907, carefully considered a proposal to notify to tradesmen from whom a sample has been taken under the provisions of the Sale of Food and Drugs Acts, when such sample has been declared by the analyst to be genuine, within seven days of the receipt of the Public Analyst's certificate, but decided not to adopt it, having regard to the extreme difficulty of framing a notification which would not lend itself to any abuse. The statistics obtained from other metropolitan districts with regard to the practice there were as follows:—

1. No notification (22)—Battersea, Bermondsey, Bethnal Green, Camberwell, Chelsea, Deptford, Fulham, Hackney, Hammersmith, Hampstead, Holborn, Islington, Kensington, Lewisham, Paddington, St. Marylebone, Southwark, Stepney, Stoke Newington, Wandsworth, Westminster, Woolwich.

2. Modified notification (4)—Finsbury, Greenwich, Poplar, and St. Pancras, thus:—

(a) In Finsbury, when a sample has been found genuine, the following post card intimation is sent to the vendor, viz.:—

Dear Sir,

I beg to inform you that no proceedings will be taken by the Borough Council in respect of the sample of _____ purchased of you by the Inspector on the day of _____ 190_____.

I am, yours faithfully,

(b) In Greenwich a notice is sent to the vendor in the following terms:—

Dear Sir,

I have much pleasure in informing you that it is not the intention of this Council to take any further steps in reference to the samples numbered _____, purchased on the _____.

I am, yours faithfully,

This form has recently been adopted by Greenwich because it was found previously that when letters were sent to vendors stating that the samples were found to be genuine, the letter was sometimes used as an advertisement.

(c) In the borough of Poplar a verbal intimation is given to the vendor at the time of the purchase of the sample that if he hears nothing to the contrary within a month, the sample has been found to be genuine.

* From the Annual Report on the Health of the Borough of Lambeth, 1907.

(d) In the borough of St. Pancras the following resolution recently passed by the Council is observed, viz.:—"That in future where samples of food and drugs are purchased for analysis from tradesmen in the borough, they be informed at the time of purchase that on applying to the medical officer of health after twenty-eight days from that date they will be told whether the analysis is satisfactory or not."

3. Notification (1)—Shoreditch, as follows:—When a sample has been found to be genuine, a card, enclosed in an envelope, and bearing the following particulars, is sent to the trader, viz.:

Date of despatch of card.

Sample No.

And merely the word "Genuine";

whereas, in those cases in which a sample is not genuine, but in which legal proceedings are not advisable, a somewhat similar card is sent to the tradesman, but, instead of the word "Genuine," the words "No Action" are printed.

With respect to the twenty-two boroughs where no notification is given, there are four, viz., Bermondsey, Camberwell, Fulham and Holborn, in which a communication is made to the vendor where a sample has been found, on analysis, to be not genuine, but the adulteration is not sufficiently large or serious to warrant proceedings, warning him as to the need of taking steps to ensure that the articles sold by him, in future, are free from adulteration.

In the borough of Bethnal Green it was formerly the practice to inform the tradesmen the result of the analysis, but the practice "has been discontinued, as it was found that such communications were of no real service, and were only made use of as advertisements."

In the borough of Stepney also it was formerly the practice to send an intimation to vendors that legal proceedings would not be instituted, but the practice has quite recently been discontinued by the Public Health Committee.

In the borough of Wandsworth no notice is given to the traders, except "in the case of public institutions, when samples are taken of milk, in course of delivery, purchased under contract, the result of analysis is furnished on application."

THE BETTERMENT OF BABIES.—Sheffield is interesting itself in the betterment of its babies. Mrs. Scarfield, the wife of the Medical Officer of Health for the city is the moving spirit in the "Motherhood" League of the city, and has succeeded in organizing a novel baby show. Thirteen prizes have been offered for babies of differing classes and ages. An additional prize was given for twins and another for the most hygienically dressed baby in the show. A demonstration of how to wash and dress a baby was also a feature of the show. Upwards of 400 babies were exhibited.

MIDWIVES' NOTES.

THE Central Midwives' Board are now issuing a leaflet on "Cancer of the Womb," drawn up at their request by Dr. Champneys for midwives and candidates for the Board's examination. As local supervising authorities may wish to distribute this leaflet to the midwives under their control, we give the text in full. Application for copies—price 1s. per 100, post free—should be made to the Secretary of the Board, at Caxton House, Westminster.

CANCER OF THE WOMB.

This disease is probably the greatest dread of women. Unless treated early by removal it always ends in death. At first it is only in the part attacked, and is not "in the System."

If removed early it can frequently be cured.

Every day, and even every minute, is of importance, and no time at all should be lost.

The earliest symptom is generally a red discharge, which does not occur at the proper time for the monthly period. This may be quite slight.

If the womb bleeds on touch this generally means cancer.

The discharge does not generally smell bad, nor is there pain, at first.

A bad-smelling discharge should always be attended to at once.

Any discharge, either red or offensive, in a woman in whom the monthly periods have ceased for some time should be attended to at once.

It is not true that "the change of life" is properly marked by floodings, or by irregular bleedings, or by special discharge of any kind.

It often happens that a woman who has floodings or irregular bleedings or marked discharge about the time of "the change of life" is told by her friends that it means no harm and is "only the change of life."

Instead of going to a doctor she does nothing until the disease is so far advanced that no operation will save her, and she throws away her life.

All women who have floodings, or irregular bleedings, or marked discharge of any kind (especially if offensive, but also even if not offensive) should go at once to a properly qualified medical practitioner, and ask to be examined thoroughly. If women did this many lives could be saved.

All women (such as nurses and midwives, but not only they) who are especially liable to be consulted on these matters, should avoid expressing any opinion of their own, but should advise the inquirer to go at once to a properly qualified medical practitioner and insist on being examined.

F. H. CHAMPNEYS, M.D., F.R.C.P.,

Chairman of the Central Midwives' Board.

June, 1908.

This leaflet was drawn up and issued at the request of the Board.

The thoroughness of the test, afforded by the examination of the Central Midwives' Board, is seen in the papers set, of which the following is an example. Of course, in fact, the *viva voce* examination is even more comprehensive and effective as a test.

EXAMINATION PAPER (CENTRAL MIDWIVES' BOARD).

June 16th, 1908.

1. What are the causes of rupture of the membranes before the neck of the womb is fully dilated, and what complications in labour might you expect under such circumstances?

2. Describe in detail the management of twin labour after the birth of the first child, and give reasons for all you do.

3. Describe the means by which nature separates and expels the placenta from the womb.

4. What is meant by asphyxia of the new-born child? What varieties are there, and how should each be treated?

5. What are the commonest causes of sore nipples, and to what dangers may they expose the mother? How may they be avoided, and how would you treat soreness when it arose?

6. According to the rules of the Central Midwives' Board, under what conditions is it necessary for the midwife to communicate with the local supervising authority?

A candidate for the Board's certificate must herself have conducted twenty labours, Rules C. (1). In answer to an inquiry as to the definition of "personally delivering" the Board decided as follows:—

No case can be counted in which the pupil has not made abdominal and vaginal examinations (that is more than one) and has also personally delivered the head and body of the child and the placenta and membranes. This excludes all cases known as "B.B.A." (born before arrival), and also all cases in which the labour is too far advanced on arrival to make (repeated) abdominal and vaginal examinations possible. It also forbids the same case being counted to more than one person. The fact that medical help becomes necessary to apply forceps or otherwise assist delivery, does not prevent the case being counted to the pupil.

The Board are asking the Privy Council to introduce into Parliament this year, a Bill for the amendment of Section 5 of the Act, so as to provide for the appointment of the balance, not met by fees or the receipts, of the annual expenditure of the Board, on the basis of population of local supervising authorities, according to the last census for the time being. The official circular for August of the County Councils' Association shows the difference to be thus effected in distribution of the burden. To raise a balance of £1,511, at present Lancashire contributes £146, and the West Riding £118, as compared, for instance, with London only £73, the East Riding £3 3s., and Anglesey 3s. By population, the former counties would contribute £101 and £87 respectively; London and the latter counties £284, £10, £3 3s. The desirability of this change was affirmed by the County Councils' Association before being discussed by the Central Midwives' Board.

Amongst the offences in thirty-four cases of midwives reported from fourteen different counties and considered in a special penal

sitting, of the Board in July, may be noticed neglect to provide herself with appliances (7), neglect to send for medical assistance (6), drunkenness (3), refusal to produce equipment for inspection, practising while under suspension, neglect of patient, and supplying pills with intent to procure abortion. Most of the names were removed from the midwives' roll; six were cautioned or censured, and their local supervising authorities asked to report on their conduct after three months.

It is not only the Board and local supervising authorities that erring midwives have to fear. In Northamptonshire recently, the Midwives' Act Committee of the county council failed to find a *prima facie* case against a certain midwife on a certain complaint; but a patient sued her for negligence before the county court, and the jury awarded £20 damages against the midwife.

The Midwives' Defence Association, worked from the Midwives' Institute, finds fresh grist to its mill in prosecution under "The Notification of Births Act," but the Association is very poor; it cannot as yet do more than write a solicitor's letter, and unfortunately the mischief is often done and cannot be righted. Not least of the good midwife's grievances under the Notification of Births Act, is her supposed breach of confidence, due to the talkativeness of the health visitor, who has access to private information, supposed by the patient to have been made known only to doctor and midwife. This is an especial danger in illegitimate births, and a danger that may bring medical officers of health into conflict with the Midwives' Defence Association, unless the health visitors be most carefully selected and advised.

An informal, but influential conference was held on July 2nd, at 4, Rutland Gate, at the invitation of Mrs. C. E. H. Hobhouse, to consider the problem of the supply of midwives. The British Medical and County Councils' Associations, eight central organizations concerned in the work of midwives, and twenty-five county nursing associations sent representatives.

It was decided to appoint a small committee to collate the statistics already published, with a view to proving the inadequate supply and asking Government for a grant, so soon as the Poor Law Commission has reported. It was resolved that any such grant should be given to county councils, and should be applied for training only, not for maintenance of midwives. A side issue was raised in a motion for registrars of births to add in each case the name, status and address of the person who delivered the mother. Not least important was a resolution pledging the bodies represented at this conference not to take independent action in approaching Government in the matter. Mrs. Hobhouse will indeed have done good work, if she can harness these forces into a single team.

REVIEWS.

THE HEALTH OF THE SCHOOL CHILD. By Dr. W. Leslie Mackenzie. Methuen & Co.

This book contains three excellent papers on School Hygiene, which the author read at various societies, a detailed and instructive account of the methods of medical inspection employed at Nuremberg and Wiesbaden, and a description of the general plan of a German elementary school. It contains also an interesting account of the re-vaccination of some seventy school children from a Wiesbaden elementary school; and from this account it appears that they manage these things better in Germany, for each child was vaccinated with a separate lancet—a method that might with advantage be made general in this country. Dr. Mackenzie's book is the work of an enthusiast, whose enthusiasm is tempered with knowledge and common sense. It is written in clear, non-technical language, and it is a book that school doctors may not only read with profit themselves, but may also recommend with confidence to the members of their education committees, and to school managers and teachers.

TUBERCULOSIS: ITS ORIGIN AND EXTINCTION. By W. Pickett Turner, M.D. Adam and Charles Black.

In view of the enormous importance of tuberculosis, it is not surprising that a multitude of hypotheses have been put forward to account for its prevalence. Among these is Dr. Hamer's suggestion that with tuberculosis, as with yellow fever and malaria, some intermediate host is necessary. A similar view is taken by Dr. Pickett Turner, who believes that "the intermediary indispensable host is cattle, from which all other animals derive the disease." According to Dr. Turner, cattle acquire the disease from Timothy grass, the bacillus, although a saprophyte in a state of nature, becoming pathogenic when the cattle are "deprived of actinism," and the preventive method he advocates is the housing of cattle in buildings with glass roofs. Dr. Turner has, in an eminent degree, the courage of his convictions, and his method of attacking tuberculosis by the provision of cowsheds roofed with suitable glass possesses, at all events, the merit of simplicity. We hope Dr. Turner will continue his consideration of this subject, and that his next publication will contain more evidence in support of his opinions than we can find in the present volume.

FUNCTIONAL NERVE DISEASES. By A. T. Schofield, M.D. Methuen & Co. Price 7s. 6d.

The development of school hygiene may be said to have brought functional nerve diseases within the ever widening scope of public health administration; at all events, the importance of these diseases is so great that no medical man can afford to neglect them. Dr. Schofield has essayed to present a popular account of hysteria, neurasthenia and kindred disorders, and he has certainly produced an interesting and readable volume. He

has convinced himself that nervous diseases are increasing, and (on page 7) he attributes the increase to the "perpetual hustle and competition" of modern life, which has not only put "an ever-increasing strain on the nervous system," but also "tends to preserve and propagate the weak stock by a care of the unfit that was formerly unknown." But on pp. 59-60 he declares that the increase of nervous disease is "due far more to the prevalence of influenza than to increased pressure of life." We cannot find in Dr. Schofield's book, or elsewhere, any satisfactory evidence that functional nervous diseases have increased; while it is probable that the keener struggle of modern life has had its beneficial side in the diminished consumption of alcohol with which it is associated. The quiet country life so often extolled is not infrequently associated with excessive drinking, as many country practitioners can testify.

CHOCOLATE.—Two cases have been heard by Mr. Mead, at Marlborough Street Police Court, in which the question arose as to the composition of chocolate. Samples of a cheap sweetmeat sold retail at the rate of a halfpenny an ounce were purchased by one of the Westminster City Council's inspectors. One was called "Milk Chocolate," the other "Broken Chocolate." On analysis, it was found that the former did not contain more than $2\frac{1}{2}$ per cent. of cocoa, the latter about $2\frac{1}{4}$ per cent., whereas genuine chocolate should contain 30 to 50 per cent. of cocoa (30 to 40 per cent. being the usual amount in chocolate for eating). The proportion of milk in the one sample was also very little. The other ingredients were similar in the two samples, viz.: sugar, cocoa-nut oil (not cocoa butter from the nib or bean), some starch, and about 8 per cent. of a powder made from the husks or shells of the cocoa nib.

Evidence in support of the prosecution was given by Messrs. Ellis Richards and C. H. Cribb, two of the public analysts for the City, Mr. Alfred Bramen, agent for Messrs. Suchard, Ltd., Mr. Norman Boon, chemist and professional adviser to Messrs. Cadbury Bros., Ltd., and Mr. Ernest Bernhard, assistant manager, Nestlé's Anglo-Swiss Milk Company. These stated that chocolate should be made from sound cocoa beans free from shell or husk, with cane or beet sugar, with or without a slight flavouring of vanilla. In an analysis of over 30 different milk chocolates, only one came out with so little as 9 per cent. of milk solids, the highest was 24 per cent.

The Magistrate said he must take a common-sense view of what milk chocolate should be; there must be a substantial quantity of cocoa in proportion to other ingredients. The sample sold to the inspector was a fictitious article, and it was unjustifiable to call it milk chocolate. If there was a demand for such a sweetmeat, it could be sold under some other name. He fined the defendant in this case £5 and £10 10s. costs.

In the second case, in which the preparation was made by another firm, Mr. Mead imposed a penalty of £2 2s. costs.

PROCEEDINGS OF THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

ELECTED REPRESENTATIVE MEMBERS OF COUNCIL, 1908-9.

Branches.	Number of Representatives.	Names of Representatives.
Metropolitan ...	2	Dr. R. Dudfield. " H. W. Roberts.
Midland ...	2	" A. Bostock Hill. " H. Manley.
North-Western ...	2	" W. Berry. " A. Greenwood.
Yorkshire ...	3	" J. S. Cameron. " W. A. Evans. " J. Mitchell Wilson.
Home Counties ...	2	" H. Meredith Richards. " C. Sanders.
Northern ...	1	" J. W. Hembrough.
Southern ...	1	" W. G. Willoughby.
Eastern ...	1	" H. Cooper Pattin.
West of England and South Wales ...	2	" W. H. Symons. " J. Tubb-Thomas.
Scottish ...	1	" A. K. Chalmers.

N.B.—In addition to the above elected representatives, the President and Hon. Secretary of each Branch are *ex-officio* members of the Council.

Article 17 of the New Articles of Association reads as follows—

THE COUNCIL.

The Management of the Association shall be vested in a Council which shall consist of—

- The officers of the Association (including the Presidents of Branches), together with the Honorary Secretaries of all the Branches, *ex-officio*.
- Elected representative Fellows, on the direct *pro rata* basis of one representative of each Branch for every completed 50 members or part of 50 (over 25) formally joined to such Branch, in accordance with the terms of Article 7, provided that
 - Any Branch, the membership of which includes less than 50 members, shall be entitled to one elected representative, and
 - Any Fellow, appointed by a Branch as a representative, shall be a Medical Officer of Health (acting or retired).

North-Western Branch.—Minutes of Committee meeting held at the Victoria Hotel, Manchester, on June 19th, 1908. *Present*: Dr. Sergeant (in the chair), Drs. Coutts, Garstang, Peck, Greenwood, Wheatley and Barlow. Officers: The question of the election of officers for next session was considered, and the committee unanimously recommended to the Branch the following selections: President, Dr. W. M. Hamilton; Vice-President, Dr. H. Peck; Hon. Sec., Dr. W. N. Barlow; Hon. Treasurer, Dr. F. J. H. Coutts; Hon. Librarian, Dr. J. J. Buchan; Representatives

on the Council, Dr. Hamilton and Dr. Greenwood, Dr. Barlow, *ex-officio*. Dr. Wheatley refused to be nominated, and Dr. Sergeant, as President of the Society is, *ex-officio*, a member of the Council.

Committee: Drs. W. Berry, A. E. Brindley, J. Chronnell, F. J. H. Coutts, W. F. Dearden, H. E. Edlin, T. W. H. Garstang, A. Greenwood, H. H. I. Hitchon, E. W. Hope, A. W. Martin, J. Niven, H. Peck, E. Sergeant, C. H. Tattersall, A. E. Thomas, F. Vacher, J. Wheatley, J. B. Wilkinson.

Accounts: The accounts for the year were presented by the Treasurer, having been audited by Drs. Garstang and Greenwood, and the committee recommended their adoption. The accounts showed that there was a balance due to the bank of £10 11s.

GENERAL MEETING held at the Victoria Hotel, Manchester, on June 19th, 1908. *Present*: Dr. A. E. Brindley (in the chair), Drs. Garstang, Wheatley, Greenwood, Peck, Buchan, Daley, Paddock, Arnold, Buckley, Welsh, Hitchon, Coutts, Sergeant, Edlin, Carnwath, Hutchinson, Dearden, Harris, Thomas and Barlow.

Apologies for absence were read from Drs. Fraser and Hamilton.

Resignation: Dr. Laird, Medical Officer of Health, Crewe, wrote regretfully resigning his membership of the North-Western Branch and the post of Hon. Librarian, owing to his removal from Crewe to Cambridge.

Minutes of last meeting were read, confirmed, and adopted.

The recommendations of the committee with regard to the officers for next session were adopted on the proposition of Dr. Wheatley, seconded by Dr. Greenwood.

The accounts for the year were received and adopted on the proposition of Dr. Sergeant, seconded by Dr. Edlin.

A Paper was then read by Dr. THOMAS on "Drains and Diphtheria," in which Dr. Thomas stated that he had bacteriologically examined the air in sewers, and also the throats of workers in sewers, and that he had absolutely failed to find the Klebs-Löffler bacillus. He thought there was no direct relationship between the two, and that the time had arrived when we ought to relieve diphtheria "from the incubus of this makeshift association, and place it in its proper light as a disease of contact of person."

Dr. BUCHAN thought that Dr. Thomas had voiced the views of Medical Officers of Health generally, as distinct from general practitioners. He did not agree with Dr. Thomas when he said that old writers on medicine were altogether wrong in describing malaria as being in some way due to marshy soil. Dr. Buchan thought that although marshy soil was not the cause of malaria, still it was a factor which could not be neglected.

Dr. COURTTS thought that instead of comparing diphtheria with malaria, a better comparison would have been made with tuberculosis. He thought that the opinions with regard to diphtheria were going through the same phases as they have done

with regard to tuberculosis. A short time ago the bacillus was all-important; now the bacillus is of very little value in connection with the spread of the disease, and efforts for prevention are mainly directed towards predisposing conditions. It appeared to him that Dr. Thomas laid too much stress on the bacteriological cause of diphtheria, at the expense of the predisposing causes. The germ was not the only factor in causing diphtheria.

Dr. PECK thought there was a distinct connection between drains and diphtheria, and he instanced a case which had occurred in his experience at a school.

Dr. WHEATLEY thought it would be a mistake and a hindrance to sanitary reforms if it went forth from a meeting such as this that there was no connection whatever between drains and diphtheria. He thought that most of the improvement in drainage, etc., had been carried out owing to the fact that it was generally believed there was a direct relationship between drains and such diseases as typhoid and diphtheria.

Dr. EDLIN agreed generally with Dr. Thomas's views. In the inquiries he had made it was a rarity to find bad drains in the houses at which diphtheria had occurred.

Dr. BARLOW, in proposing a vote of thanks to the writer of the Paper, also expressed his opinion that the influence of drains in connection with diphtheria had probably been exaggerated. He thought, undoubtedly, bad drains were one of a very large number of other factors, predisposing not to this disease in particular, but to any disease. He did not agree at all with Dr. Wheatley. On the contrary, he thought there was a distinct danger in allowing people to continue to have the belief that either diphtheria or typhoid was directly caused by bad drains. It left the door open for many actions at law against public bodies.

Dr. SERGEANT seconded the vote of thanks. He thought that diphtheria was more a contact disease than anything else, but probably drains had some influence.

Dr. BRINDLEY also thought that the disease was contracted by personal contact, but his experience confirmed him strongly in the opinion that defective drains were part of the predisposing cause of diphtheria. He instanced an outbreak of diphtheria in the neighbourhood of a drain culvert which had been opened for cleansing purposes.

Dr. THOMAS, in his reply, stated that he had heard nothing which had caused him to change his opinions in the slightest. In his opinion there was no relationship between diphtheria and drains, and he agreed with Dr. Barlow that there was a distinct danger in allowing the public to continue to hold the views on the subject they at present have.

Yorkshire Branch.—The Annual Outing of this Branch took place on the 21st August at Huddersfield and neighbourhood. The members were conveyed in motor cars to the fine water-works of the Huddersfield Corporation in the Marsden Valley. An inspection was made of the Butterley, Blackley, and also the Blackmoorfoot reservoirs. At the last-named place the method

of treating moorland water with whiting was seen. The apparatus is in a small building on the banks of one of the conduits, to which a head of water is taken to dissolve the whiting; the solution then drips into the conduit by an overhead trough.

A visit was also paid to the Meltham Isolation Hospital, a new building, which might be said to be quite up-to-date. Here, by the hospitality of the committee, refreshments were provided.

The members present were Dr. Burman (President), Wath, Drs. Halliwell (Dewsbury), Hicks (Easingwold), Jackson (Ardsley), Kaye (Wakefield), Lambert (Farsley), Moore (Huddersfield), Richardson (Ravensthorpe), Ross (Penistone), Sisam (Wakefield), Smiles (Honley), Sutherland (Cleckheaton), Thorp (New Mill). Alderman Benjamin Broadbent, Dr. Clappett and others were present as visitors.

Home Counties Branch.—The Annual Meeting of this Branch was held on Thursday, 9th July, 1908. By the invitation of the retiring President (Dr. Crookshank) the members first assembled at his house, 27, The Terrace, Barnes, to luncheon. After this pleasant function the company were conducted to the Barnes Isolation Hospital. The business of the Branch was there transacted, and the following officers elected for the year ensuing: President, Mr. F. E. Fremantle, County Medical Officer of Health, Herefordshire; Hon. Treasurer, Dr. Alfred Ashby, Medical Officer of Health for Reading and Wokingham; Hon. Secretary, Dr. Sidney C. Lawrence, Medical Officer of Health, Edmonton. The election of two representatives on the Council, besides the President and Hon. Sec., who are *ex-officio* representatives, was deferred until the meeting in October, when Mr. Fremantle will deliver his presidential address.

Southern Branch.—A meeting was held at the Railway Hotel, Hayward's Heath, on July 3rd, 1908. Present: Drs. Griffith (President), Willoughby, Cameron, Stott (Hon. Sec.).

The accounts for the year were presented and passed, showing a balance of £3 8s., and £25 on deposit.

The following officers for the Branch were elected for the year 1908-9: President, Dr. Lauder, Hon. Sec., Dr. Griffiths. Representatives to Council, Drs. Griffith and Willoughby. Hon. Treasurer, Dr. Stott. A letter was read from the secretary of the Midland Branch in reference to the dismissal of Dr. Ridley Bailey, Medical Officer of Health for Bilston, from his position as medical superintendent of the fever hospital.

It was agreed that the Southern Branch were in complete sympathy with the resolution passed by the Midland Branch with respect to Dr. Bailey's dismissal, and they were willing to support any resolution in similar terms as drafted by the Midland Branch, if brought before the parent Society.

Dr. STOTT read notes on the Value of Sewage Treatment in Rural Districts by Sewage Farms, and after a discussion in which Drs. Griffiths, Willoughby and Cameron took part, the members and three visitors adjourned for lunch.

Visits of inspection were paid to the sewage farms of Cuckfield and Hayward's Heath Urban District Councils.

THE LIBRARY.

All Books and Publications received by the Editor and by the Hon. Librarian will be acknowledged under this heading.

Annual and Other Reports.

Registrar General's Weekly Returns and Quarterly Return. Preliminary Report on Mussels and Typhoid Fever (City of Birmingham Health Department, July, 1908), by Dr. George F. Buchan. Borough of Lewisham, 1907, by Dr. A. Wellesley Harris. Berkshire C.S.D., 1907, by Dr. W. T. G. Woodforde. City of Aberdeen, July 1908, by Dr. Matthew Hay. City of Wakefield, 1907, by Dr. Thomas Gibson. Calcutta, 1907, by Dr. T. Frederick Pearce. County of Middlesex, 1907, by Dr. C. W. F. Young. City of Bradford, 1907, by Dr. W. Arnold Evans. Shropshire, 1907, by Dr. Jas. Wheatley. City of York, 1907, by Dr. Edmund M. Smith. Lanark, 1907, by Dr. John T. Wilson. Annual Report of the Rural Housing and Sanitation Association, to June 30th, 1908. Great Yarmouth, 1907, by Dr. H. W. Beach. Births, Marriages and Deaths for the year 1906, in the City of Providence, by Dr. Chas. V. Chapin.

Journals.

Hospital. Lancet. British Medical Journal. Sanitary Record. Glasgow Medical Journal. Royal Sanitary Institute. Royal Institute of Public Health. Transactions of the School Dentists' Society. Desinfektion. Tropical Medicine and Hygiene. Transvaal Medical Journal. Birmingham Medical Review. American Journal of Public Hygiene. Indian Public Health. All-India Hospital Assistants' Journal. Australasian Medical Gazette. Medical Review of Reviews. Nursing Notes. County Councils' Association. Bulletin du Service de Santé et de l'hygiène. Royal Army Medical Corps. Reale Società Italiana d'Igiene. Bulletin of the Board of Health of Massachusetts. Military Surgeon. American Journal of the Medical Sciences. Canadian Nurse. L.G.O.

Pamphlets.

The Milk Supply of York, by the York Health and Housing Reform Association. The Feeding of the Soldier in Barracks, in Hospital and in War, by Major Robert J. Blackham. Design of a Cow Shed, by Dr. G. H. Fosbrooke. Is the Exciting Etiological Factor of Rigg's Disease a Specific Pathogenic Germ, by J. Dencer Whittles, B.D.S. Some Observations on Pyorrhoea Alveolaris, by J. Dencer Whittles, B.D.S. Foods are not what they appear, but what they contain, by E. F. Wright.

Statutory Rules and Orders.

Board of Education: Statement of the Provision made by the Local Education Authority for the Medical Inspection of Children attending Public Elementary Schools in their Area, for the year ending 31st July, 1909. Circular to the Local Education Authorities, under Part III. of the Education Act. Shipbuilding Accidents.—A Reprint from the Annual Report of the Chief Inspector of Factories and Workshops for the year 1907. Factory and Workshops—Special Exception: Meal Times in Florists' Workshops. Factory and Workshop—Special Exception: Holidays. Factory and Workshop—Special Exception: As to employment inside and outside Florists' Workshops on the same day. Factory and Workshop—Special Exception: With regard to the overtime employment of women.

Infectious and Parasitic Diseases.

By Dr. Millard Langfield. Rebman, Ltd., London. 5/6 nett.

School Hygiene and the Laws of Health.

By Dr. Chas. Porter. Longmans, Green & Co., London. 3/6.

Death and its Verification.

By Dr. J. Brindley James. Rebman, Ltd., London. 1/.

Wastage of Child Life.

By Dr. J. Johnston. John Heywood, Ltd., London. 6d. nett.

Lumley's Public Health.

By Alex. Macmorran, K.C. and Joshua Scholefield, Barrister-at-Law. Butterworth & Co., London.

The Diseases of Children.

Vol. I.—Pathology, Symptomatology, Prophylaxis, Therapeutics, Feeding. Vol. II.—Newborn-Puberty, General Diseases, Infectious Diseases. Vol. III.—Digestive System, Respiratory System, Circulatory System, Thyroid Gland. Vol. IV.—Genito-Urinary System, Nervous System Dermatology. Edited by Drs. H. L. K. Shaw and Linnaeus La Fétra. J. B. Lippincott Co., London. £4 4s. nett.

The Public Health Acts Amendment Act, 1907.

By Arthur E. Clery, L.L.B. and Dr. J. C. McWalter.

APPOINTMENTS.

HERBERT JONES, L.R.C.S., L.S.A., D.P.H., has been appointed Medical Officer of Health for the County of Hereford.

STANLEY CHILD, M.A., M.B., B.C. Camb., M.R.C.S., L.R.C.P. Lond., has been appointed Medical Officer of Health of the West Sussex District.

JAMES SCOTT TEW, M.D., M.B., B.S., D.P.H. Camb., has been appointed Medical Officer of Health for the Districts of Cranbrook and Hawkhurst.

JOHN BROWN, M.D., M.B., Ch.B., D.P.H., has been appointed Medical Officer of Health for Bacup.

JAMES ALEXANDER STOREY, L.R.C.P. Edin., L.R.C.S.I., has been appointed Medical Officer of Health for the Dunstable District.

R. M. WILLIAMS, M.B., has been appointed Medical Officer of Health for the Menai Bridge Urban District.

AUGUSTUS MORCOM, L.R.C.S. Edin., L.S.A., has been appointed Medical Officer of Health for the Houghton Regis District by the Luton Board of Guardians.

W. C. LODWIDGE, M.R.C.S., D.P.H., has been appointed Medical Officer of Health to the Langport Rural District and Medical Officer to the Langport District Schools.

JOSEPH M. MORRISSEY, F.R.C.S.I., L. & L.M., L.R.C.P.I. & L.M., has been appointed Medical Officer of Health to the Waterford and New Ross Port Sanitary Authority.

E. F. ROSE, L.S.A., has been appointed Medical Officer of Health by the Wayland Rural District Council.

S. G. VINTER, L.R.C.P. Lond., M.R.C.S., L.S.A., D.P.H. Durh., has been re-appointed Medical Officer of Health by the Torpoint (Devon) Urban District Council.

THOMAS ADAM, M.A. Glasg., D.P.H. Camb., has been appointed Assistant Medical Officer of Health for the County of the West Riding of Yorkshire.

GEORGE HARPER PEARCE, L.R.C.P., L.R.C.S. Edin., D.P.H. Camb., has been appointed Medical Inspector to the County Council of the West Riding of Yorkshire.

JOHN DICKINSON LEIGH, M.D. Edin., F.R.C.S. Edin., D.P.H., has been appointed Medical Inspector of Schools by the Durham County Council.

E. MORTON, M.D. Edin., M.B., has been appointed Medical Superintendent and Adviser to the Oxfordshire County Council Education Committee.

WILLIAM BERRY, F.R.C.S.I., M.R.C.S. Eng., D.P.H., F.P.S. Glasg., Medical Officer of Health Wigan, has been appointed School Medical Officer by the Wigan Education Authority.

A. E. WILLIAMS, M.D., D.P.H., has been appointed Medical Inspector of Schools for the County of Flintshire.

CHARLES EDWIN MATTHEWS, M.D. Durh., L.R.C.P. Edin., M.R.C.S., has been appointed Medical Inspector of Schools for the Borough of Tiverton (Devon).

THOMAS MORAVIAN CARTER, M.R.C.S., L.R.C.P. Lond., has been appointed a Medical Inspector of Schools for the Bristol Education Committee.

THOMAS ARTHUR HEATHFIELD GREEN, M.D., C.M. Edin., L.R.C.S. Edin., has been appointed a Medical Inspector of Schools for the Bristol Education Committee.

WILLIAM THOMAS MADDISON, M.D., Lond., M.R.C.S., Eng., has been appointed a Medical Inspector of Schools for the Bristol Education Committee.

EDWARD CECIL WILLIAMS, M.B., B.C. Cantab., has been appointed a Medical Inspector of Schools for the Bristol Education Committee.

W. SOPER, M.R.C.S., L.R.C.P., has been appointed Medical Officer to Anerley School, of the North Surrey School District.

Correction.

The appointment of Dr. H. OSBORNE referred to in last number of PUBLIC HEALTH should read—H. OSBORNE, M.D. Manchester, D.P.H. Manchester, M.R.C.S., L.R.C.P., England, has been appointed Assistant Medical Officer of Health to the Salford Education Committee.

RECENT PUBLIC HEALTH LITERATURE.

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Anthrax.

EURICH (F. W.). The administrative control of anthrax. *Med. Press.*, 1908, ii, 88.

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SCHIROP (H.). Beitrag zur Biologie des Bacillus Vitulisepticus und zur Immunisierung gegen die durch denselben hervorgerufene septische Pneumonie der Kälber. *Centralb. für Bakteriöl.*, 1908, xlvii (Orig.), 307.

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HARDY (Capt. F. H.). Note upon Blackwater fever; its treatment, as seen in Nyasaland (the Harsey treatment), with suggestions on causation and treatment. *Jour. Roy. Army Med. Corps*, 1908, xi, 136.

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LANGMEAD (F.). On some modern methods of infant feeding. *Clin. Jour.*, 1908, xxxii, 219.—WALLACE (J. S.). Diet in infancy and childhood. *Med. Press*, 1908, ii, 86.

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OWEN (E.). The popular lecture on dust and disease. *Brit. Med. Jour.*, 1908, ii, 321.

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SCHOTTELIUS (E.). Ueber das Toxin und das Antitoxin der Dysenterie bazillen. *Med. Klinik*, 1908, iv, 1238.

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KERLEY (C. G.). Public school education. *Arch. of Pediatrics*, 1908, xxv, 481.

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BROCHET. Rapport sur une épidémie de fièvre à bord de *La Manche*. *Arch. de Med. Navale*, 1908, xc, 142.

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BLACKHAM (Major R. J.). The feeding of the soldier in barracks, in hospital, and in war. *Brit. Med. Jour.*, 1908, ii, 310.—DEARDEN (W. F.). Food inspection at ports of entry. *Med. Press*, 1908, ii, 143. SAVAGE (W. and G.). Examination of sausages and their hygienic preparation. *Med. Press*, 1908, ii, 167.

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DOUGLAS (C. C.). The training of teachers in personal and school hygiene. *Brit. Med. Jour.*, 1908, ii, 304.—MONTEZAMBERT (F.). Hygiene and sanitation: domestic, municipal, national and international. *Canada Lancet*, 1908, xli, 901.

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Inoculation.

THEILER (C.). Continuation of experiments on protective inoculation against equine piroplasmiasis. *Jour. Comp., Path., and Therap.*, 1908, xxi, 97.—WILLIAMS (R. S.), MURRAY (H. L.) and J. ORR. Experimental inoculation of meningo-coccic vaccine. *Bio. Chemical Jour.*, 1908, iii, 359.

Malaria.

JOHNSTON (Lieut-Col. H. H.). Prevention of malaria among the troops at Singapore. *Brit. Med. Jour.*, 1908, ii, 399.—TRANTMANN (A.). Malaria und Anophelesin Leipzig. *Arch. für Hygiene*, 1908, lxxvii, 163.

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BAINES (A. M.). The serum treatment of cerebro-spinal meningitis. *Canad. Pract. and Review*, 1908, xxxiii, 489.

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KERR (J. W.). Federal recognition of the work of the medical milk commission. *Pediatrics, N.Y.*, 1908, xx, 441.—KLOTZ (M.). Ueber Säuglingsernährung mit Yoghurt milch. *Zeit für Physik und Diät. Therapie*, 1908, xii, 261.—LANE (C. B.) and J. C. WELD. The production and handling of milk. "A dairy farm control." *Veterinary Jour.*, 1908, lxiv, 404.—SCHROEDER (E. C.). Tuberculous infection through milk. *Pediatrics, N.Y.*, 1908, xx, 422.

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HESS (A. F.). Primary tuberculosis of the mesenteric glands. Report of injections with bacilli of the human eye. *Amer. Jour. Med. Sci.*, 1908, cxxxvi, 183.—MAHER (S. J.). Tuberculosis in Connecticut, especially in rural Connecticut. *Med. Record, N.Y.*, 1908, lxxiv, 169.—OVERLAND (B.). Human tuberculosis and cattle tuberculosis: Investigations as regards ninety-seven Norwegian farms. *Lancet*, 1908, ii, 362.—ROBIN (A.). Un essai d'organisation économique de la lutte antituberculeuse. *Bull. Gen. de Therapeutique*, 1908, clvi, 193.—TROTTER (A. M.). Notes on two new methods of testing with tuberculosis. *Jour. Comp. Pathol. and Therap.*, 1908, xxi, 153.—WHITLA (Sir W.). The Cavendish Lecture on the etiology of pulmonary tuberculosis. *Lancet*, 1908, ii, 135, also *Brit. Med. Jour.*, 1908, ii, 61.

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Vaccination.

BALDREY (Capt. F. S. H.). Preventive vaccination against strangles. *Jour. Comp. Pathol. and Therap.*, 1908, xxi, 158.

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Public Health

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VOL. XXII.

THE NOTIFICATION OF CONSUMPTION.

THE sixth International Congress on Tuberculosis, which has lately concluded its deliberations at Washington, has been made the occasion for an announcement of first-rate importance to public health administrators in this country. We refer to Dr. Newsholme's official statement, on behalf of the Local Government Board, that the Board has decided to issue an order making it obligatory upon Poor Law medical officers to notify to the medical officer of health all cases of phthisis occurring amongst parochial patients. This order it appears is to apply to all parochial patients, whether treated in institutions or in their own homes, and the notification must be made within forty-eight hours of the discovery of the case; changes of address are also to be notified—an important point in connection with the notification of a chronic disease like pulmonary tuberculosis. These, we gather from Dr. Newsholme's statement, will be the chief provisions of the order the Board have decided to issue. It is not clear whether a fee will be payable for the notification; but in making their order, the Board, we hope, will not lose sight of the principle, already accepted in the notification of other infectious diseases, that the labourer is worthy of his hire.

The opinion of medical officers of health generally, will, unless we are much mistaken, be highly favourable to this new departure of the Local Government Board. There is a growing feeling that the voluntary notification of phthisis, which is now in operation in many districts, though valuable as far as it goes, is an inadequate basis for the measures sanitary authorities can now employ for the

prevention of tuberculosis, and that some form of compulsion is needed. But the compulsory notification of phthisis is a measure that at the present time should only be introduced under special conditions and with special precautions, and it would be exceedingly difficult to imagine a scheme that fulfils these requirements more completely than that which will be introduced by the forthcoming order of the Board. Notification is secured without the friction which would undoubtedly obstruct general legislation on this subject; it imposes no undue disabilities upon the patient, and it takes effect in precisely that section of the community in regard to which notification is pre-eminently needed. The Board have taken an important forward step in the great movement for the prevention of tuberculosis, and it is to be hoped that sanitary authorities will lose no time in making the fullest use of the information which, we understand, will soon be available.

The accumulation of statistical material is not, however, the object of notification, which is valuable chiefly because it enables sanitary authorities to apply those measures of amelioration and prevention which will improve the condition of the patient and prevent the spread of the disease to others. This work, which is still but little developed, will doubtless be much facilitated by the more intimate connection of the public health and the Poor Law medical services, which will probably be one of the changes in Poor Law administration that may be expected to result from the enquiries and report of the Royal Commission. In work of this kind the efforts of public authorities may be much helped by philanthropic associations and by charitable individuals; and there is no more promising field for the energies of those who would strive for the prevention of disease.

Mr. EDWARD SERGEANT, L.R.C.P., M.R.C.S., L.S.Sc.

Medical Officer of Health for the County of Lancaster.

President of the Society of Medical Officers of Health, Session 1908-9.

TYPHOID FEVER AND CHRONIC TYPHOID CARRIERS.*

By D. S. DAVIES, M.D., D.P.H.,
Medical Officer of Health, Bristol.

TYPHOID Fever has shown in England and Wales during the three and a half decades that have elapsed since it was distinguished in the Registrar-General's returns from Typhus Fever, a continuously decreasing mortality:—

Periods.	Death rate per million living.
1871-1880	322
1881-1890	198
1891-1900	174
1901-1905	110

While the mortality has decreased, however, the fatality (or case-mortality) has remained practically stationary. Thus, in the London Fever Hospital, in 1848-57, the fatality rate was 17·3 per cent.; in the Metropolitan Asylums Board Hospitals in 1871-97 the rate was again 17·3 per cent., and in the single year 1897 it was 18·7 per cent.

Upon the discovery of the bacillus of typhoid fever in the eighties, it was anticipated that control of the disease would become simple; the causal bacilli were supposed to enter, occupy and leave the body as an orderly army, leaving no stragglers, and recovery of the patient was held invariably to connote the death and disappearance of the bacilli.

If this were always so, the control of such a disease would be comparatively simple, and the knowledge that the typhoid organism is a flagellate water-living parasite, leaving the body by way of the solid or liquid excretions during the clinical continuance of the disease, and completing its life history by a more or less prolonged saprophytic existence in organically polluted soil or in water, pending its introduction into the intestinal tract of its next host, would sufficiently explain the etiology of the disease in its well-known phases as water-borne, milk-borne, oyster-carried, and so on.

But allowing for the fulfilment of these conditions in the majority of instances, there still occurred a residuum of cases which did not

fall into line with these routine conditions, and fuller knowledge of the life history of the causal parasite has become necessary in order to account for these aberrant outbreaks.

The easy habit has unfortunately arisen of referring obscure sporadic outbreaks to general insanitary conditions, and the smoke test has no doubt led to the reconstruction of much innocent drainage, the cost of which might have been better expended.

That the major portion of the decline in the prevalence of typhoid fever has been due to general improvement in drainage and water supply, is probably, in view of the nature of the disease, incontrovertible, and this obvious relationship has tended to obscure the validity of personal transference, mediate or immediate, of infection.

Two things became, however, in the course of time apparent, one, that owing to enhanced resistance to infection in certain individuals, attacks in such nearly immune persons might be represented by very slight or negligible symptoms, so that neither the patient nor his friends, nor even his medical attendant would have reason to suspect the real nature of his illness. Hence arise "ambulant" cases, and "missed" cases, affording far greater opportunities for the distribution of infection, owing to the ignorance of any need for, and consequent lack of, precautions; the other, that after apparent recovery, some of the bacterial diseases may persist in the patient, who, himself immune, may become a "carrier" of the disease, and be potentially infective towards others.

An account of two institution outbreaks traced to the same "carrier."—The occasional persistence of the *B. typhosus* in the human body over long periods has been recognised for some years, and the possibility that this condition might afford the explanation of obscure outbreaks was suggested by Horton Smith, in his Goulstonian Lectures in 1900 [16]. At that time it was generally accepted that the *B. typhosus* could be demonstrated in the stools, if care was taken, during the first and second and early part of the third week of the disease, and possibly during the early part of the relapse. Later than this it could not be demonstrated by the laboratory methods then available. It was known, however, from the experiments of Chiari [4], that the bile in the gall-bladder contains the *B. typhosus* in the majority of typhoid cases, and often in pure culture.

It was naturally supposed at first that, as the fever passed away, and as health returned, the bacillus, the cause of the disease, would disappear from the tissues also, and this was demonstrated to be the case in some of the earliest observations. But the experiments of Blackstein and Welch [1] showed that sometimes at least the typhoid bacillus might remain for much longer periods; experimentally, in rabbits, it was found in the bile 128 days after the date of inoculation, and this suggested that the same thing might occur in man. Between 1894 and 1896, Buschke [3], Sultan [18] and Bruni [2] quoted cases in which the bacilli were found in the pus from bone abscesses, in two instances six years after the primary fever, and in one case seven years after. Hunner [7] quotes cases in which cholecystitis was shown to be accompanied by the presence of the *B. typhosus* in pure culture, in one case three months after the fever, in another eight months, and in a third after an interval of seven years. Von Dungern [6] records a case in which, fourteen and a half years after the attack of typhoid fever, the bacilli were still present in pure culture in the cystic contents [5].

These facts have hitherto remained largely ignored in their epidemiological relationship, partly because the assumed rarity of their occurrence suggested that they were merely bacteriological curiosities, and partly because the isolation of the *B. typhosus* from the faeces was at that time not only difficult but very uncertain. In 1906, however, owing to the continued prevalence of sporadic typhoid in South Germany, the subject was taken up with the advantage of modern and more certain laboratory methods, and Klinger [10] found that persons in apparent health can harbour typhoid bacilli and excrete them. The German observers divide "carriers" into two classes:—

(1) "Acute carriers," who have a shown no symptoms, but, after being in direct contact with patients, may carry and excrete bacilli for a short time and in small numbers.

(2) "Chronic carriers," who have a short or a long time before gone through a regular attack of typhoid, and may excrete for months or years more or less pure cultures of typhoid bacilli.

The "chronic carriers" are obviously the most dangerous class; about four per cent. of typhoid patients appear to become carriers;

the condition is most common in women, and the bacilli apparently are harboured in the bile in the gall-bladder or in the intra-hepatic bile passages, whence intermittently they are discharged and excreted with the faeces. This condition may persist for as long as twenty-nine years [5]. When these chronic carriers are engaged in the preparation of food, or in dairy work, they are apt to give rise to intermittent local outbreaks of typhoid fever, probably by contamination of the food with the hand after defaecation or micturition. Kayser [8] quotes the case of a proprietress of a bakehouse at Strasburg, who prepared the meals for the employes, where each journeyman developed typhoid soon after arrival; her stools were full of bacilli, and she gave a distinct Widal reaction (1—100). Soper [17], of New York, records the case of a cook, who, in five years, lived in four families and gave rise to twenty-eight cases; the bowel discharges furnished practically pure cultures of the typhoid bacillus, and the extrusion of bacilli in her case was shown to be intermittent. A. and J. C. G. Ledingham [11] record thirty-one cases in fourteen years at an institution in Scotland, finally traced to carrier cases.

I believe it will be found that the two instances I am about to narrate are the first recorded outbreaks in England traced to the influence of a typhoid "carrier."

I.—OUTBREAK OF TYPHOID FEVER AT THE BRENTY CERTIFIED INEBRIATE REFORMATORY, BRISTOL.

In November, 1906, my attention was first called to an outbreak of typhoid fever at this institution. The general circumstances of the outbreak have been so fully detailed in a Parliamentary paper [14] that the case will now be presented as briefly as possible.

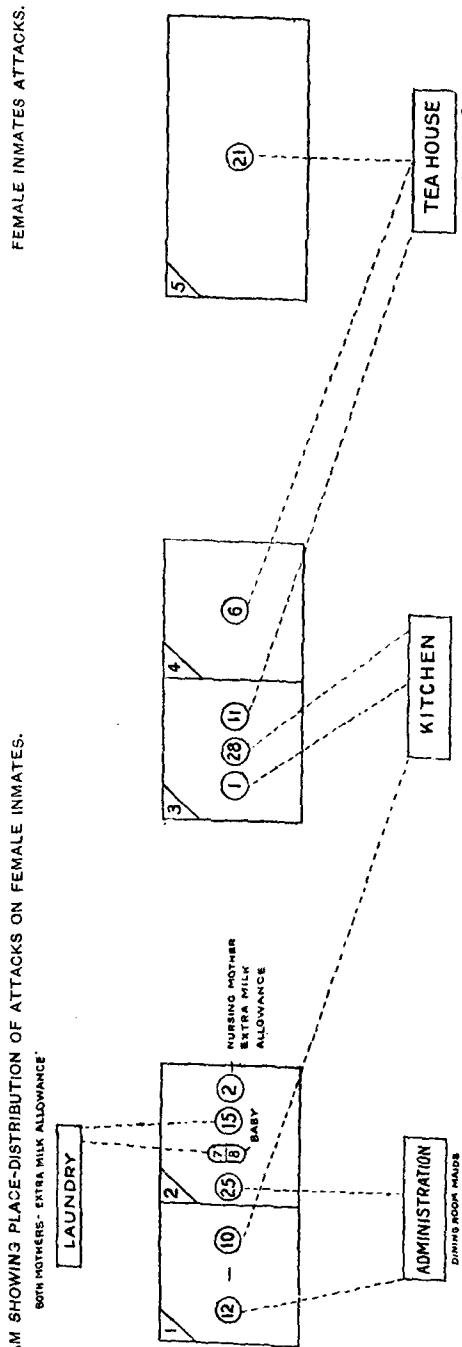
The essential facts are these: the Home contains 240 inmates and 24 resident officers; it has been opened since 1899, and typhoid fever first appeared in 1906. The water supply is good and the drainage presented no defects able to account for the occurrence or distribution of the disease. No cases of typhoid fever existed in the neighbourhood. In September, 1906, a kitchen helper developed typhoid, and in November three more cases occurred (Chart I.). These cases already suggested carriage by milk, for one was a female inmate who received an extra allowance of one pint of milk daily as she was nursing; another was the gardener's wife, who lived in

* From the Annual Report of the Medical Officer of Health of Bristol, 1907.

BRENTY.

CHART II.

DIAGRAM SHOWING PLACE-DISTRIBUTION OF ATTACKS ON FEMALE INMATES.

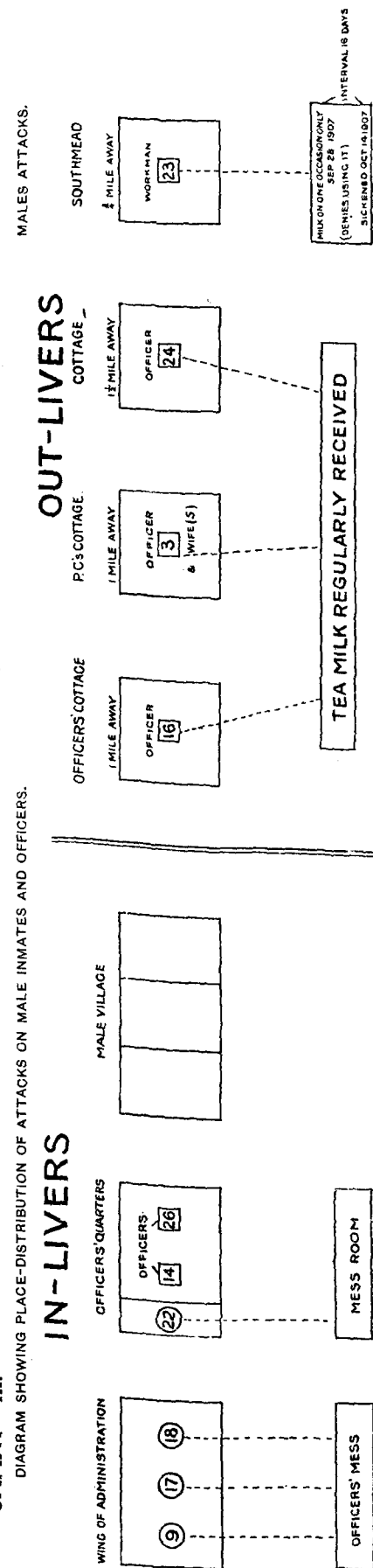


This Diagram shows the grouping of the 11 female inmates according to their place of abode and according to their work. The grouping apparently suggests nothing as to place-infection but it is noticeable that every female inmate attacked either had an extra allowance of milk or had special access to food (including milk) in the administration (as dining room maids), in the kitchen, or in the tea house. The only persons living and sleeping in 4 and 5 who were attacked were (6) and (21) both working in the tea house. Nos. 2, 7 and 15 are the only female inmates receiving extra milk allowance and all three were attacked. The three Female Officers living out were the Matron (No. 19) whose attack dated from the Tea Party on July 3 on which date a Visitor who stayed to tea also contracted Typhoid. Miss H. (No. 13) who slept in No. 3 and was Kitchen Officer, and Miss P. (No. 27) who slept in No. 3 and worked generally in Female Village serving meals, etc.

BRENTY.

CHART III.

DIAGRAM SHOWING PLACE-DISTRIBUTION OF ATTACKS ON MALE INMATES AND OFFICERS.



The Inmates 9, 17, 18 and 22 were the only ones engaged in tea-making or in attendance upon Officers' Mess at the time of their attack. The Officers living out who were attacked, all had tea-milk regularly supplied. None of the nine Officers living out who had no tea-milk supplied were attacked.

appearance during this attack was consistent with a masked attack of typhoid fever, although he gave a negative Widal on July 21st and on December 10th.² If this was really a minimal attack of typhoid, it may account for his immunity. Chart 3 shows that all the four male inmates attacked were directly employed in the officers' mess-room, where they had access to milk. Cases 17 and 18 took on Case 9's duty and sickened in turn. The three officers who lived out and were attacked all had tea-milk regularly supplied; one workman who had milk served out to him once on September 28th, 1907, but denies drinking it, sickened on October 14th. Of the nine officers who lived out, but received no milk, not one sickened.

*Pathological Investigation.—The laboratory results obtained in the case of Mrs. H. are here summarised: (A) On November 18, 1907, two samples of her blood both gave the following reactions (Widal):—

Dilution	Time	Reaction
1 in 10	60 min.	Loss of motility; agglutination complete.
1 " 25	"	Loss of motility; agglutination present but incomplete.
1 " 50	"	No change.

The urine yielded neither *B. typhosus* nor *B. coli*. The faeces yielded no organisms resembling the *B. typhosus*, but chiefly *B. coli*. Generally the excreta appeared to be normal. (B) On November 29th, 1907, the faeces similarly yielded no organisms resembling the *B. typhosus*, and were apparently normal. (C) On December 20th, as Mrs. H., after slight abdominal pain, had passed a light brown to yellow brown loose stool of uniform soft consistence, not unlike an early typhoid stool, containing no excess of mucus, blood or fat, opportunity was taken to make a third examination. Typhoid bacilli, giving all the typical reactions, were upon this occasion isolated from the faeces. The bacilli were freely motile and reacted to immune serum thus:—

Dilution	Time	Reaction
1 in 25	30 min.	Loss of motility; complete agglutination
1 " 200	"	Loss of motility; complete agglutination

The intermittence during November is noteworthy. Upon the failure to recover the *B. typhosus* in November, it was decided to

(2) See PUBLIC HEALTH, July, 1907, p. 607: "Some difficulties in preventing Personal Infection in Enteric Fever," for interesting points relating to mild attacks of typhoid fever in children.

* Prof. Walker Hall, Professor of Pathology, Bristol University College Medical School, and Pathologist to the Bristol Royal Infirmary, is responsible for the laboratory results.

make additional examinations of certain inmates who had more or less to do with food preparation or dairy work. Sixteen blood examinations and twelve examinations of faeces were carried out, but failed to demonstrate another "carrier." In the faeces of the typhoid convalescents examined, the *B. coli communes* exhibited many alterations from their usual reactions. They rarely were quite typical. One or more of the biological tests were always less pronounced than usual.

Methods.—The faeces were collected free from urine and placed in vegetable parchment paper and then in stoneware jars. They were conveyed to the laboratory as rapidly as possible. On arrival, ten platinum loopfuls, taken from different parts of the material, were transferred to a tube of sterile normal saline solution. After shaking, a loopful of this mixture was placed in a broth tube. From this latter tube a loopful was taken and put into a tube containing the following medium: ordinary beef broth with 0.1 per cent. sodium taurocholate and 1 in 1,500 malachite green (Grübler). In isolating the *B. typhosus* from material other than faeces, the Loeffler malachite green gelatine medium has been used with successful results. With the faeces, however, the green colour soon fades, organisms other than the *B. coli communis* grow well, and the plating is slow and less satisfactory. Hence the use of the present medium. Klein [9] has suggested this manner of culture for the isolation of organisms from shellfish. McWeeney (1908 meeting of the Pathological Society of Great Britain and Ireland) showed cultures obtained in a similar way, but without the addition of the bile-salt. After twenty-four hours' growth in the malachite green broth, a loopful of the culture was transferred to a second broth tube, and a series of six plates were inoculated by spreading a loopful of this culture over the surface or allowing a few drops to run over the surface. The plates were then left partially uncovered in the 37° C. incubator for half an hour, and then fully covered and inverted. As a rule five McConkey bile-agar plates and one Conradi-Drigalski plate were used for each sample. Twenty-four hours later the colourless, non-lactose colonies were examined for motility in a hanging drop preparation, and, after further plating, were transferred to tubes containing the following media: glucose broth, mannite broth and lactose broth. When

colonies were obtained which formed acid, but did not produce gas in these media, they were further cultivated in dulcete, saccharose and sorbite broths; and in litmus milk, neutral red agar, glucose-agar, Barsiekow's medium with glucose, and with lactose; and in peptone water for the indol reaction. The organism which gave the distinct typhoid reactions was then treated with serum from cases attacked in the present epidemic and with immune horse serum.

Danysz Virus.—As this had been used in an attempt to kill off the rats infesting the premises, and it had been suggested that this might have some causal relationship to the outbreak, a rat was forwarded in November, 1907, to Professor Hewlett, with negative results. Bainbridge has recently stated that Danysz's bacillus and the bacillus of mouse typhoid are practically identical. These organisms have been considered non-pathogenic for man, but an outbreak of fatal enteritis has followed the consumption of food contaminated by similar virus. Although the substance is sold publicly as harmless, it is evident that careful handling is necessary.

Swine fever broke out on two occasions, viz., in July, 1906, and from March to September, 1907. This was dealt with under veterinary advice. There is generally supposed to be no connection between human and pig typhoid, but we should have liked to make some inquiries as to the possibility of infection from "carrier" to pig, and generally into the relationship between human and pig typhoid. However, as the pigs had been destroyed before the investigation was taken up, no opportunity offered itself.

Confirmation of causal influence of carrier by evidence from a previous outbreak.—The belief that Mrs. H. was the actual cause of the Brentry outbreak, if not proved by the foregoing sequence of events, at least provided a working hypothesis which stood the test of experiment. The necessary control experiment was found by tracing back her history to a period (1904) when she was in service at another institution, where a similar outbreak occurred.

II.—THE OUTBREAK OF TYPHOID FEVER AT GROVE HOUSE HOME FOR GIRLS, BRISLINGTON, NEAR BRISTOL.

In 1904, this Home was occupied by thirty-six girls (aged from 5 to 15) boarded out by the Bristol Guardians and supervised by four

officers. Typhoid fever first appeared in the third week of May, and from that time until the end of September, when the Home was closed, cases continued to occur in crops at intervals of a week or more (Chart 1). Twenty-five cases developed typhoid fever, eight other suspicious cases occurred, and two deaths resulted. Thus nearly all the girl inmates were attacked. How the first case arose it was found impossible at the time to ascertain; there had been no typhoid in the district for months.¹ The cases occurred in groups at intervals, many cases were very mild, the water supply from the Bristol Waterworks Company was above suspicion, there were no other cases among the dairyman's other customers, nor was the manner of the outbreak suggestive of contamination of water or milk supplies; no defects in the drains were discoverable likely to have any influence in causation. No cases occurred during 1904 in the district except at this Home. Every possible means were taken to control the disease by disinfection, boiling of milk, cleanliness, and precautions as to food, all without avail. The medical officer of health, warned by previous experience in diphtheria, shrewdly suspected a human "carrier," and the girls, but not the staff, were systematically examined by the Widal test. Still the outbreak went on, and did not cease until the home was closed at the end of September and the children boarded out at various other homes. The cook left to take a private situation. This history might have been held to afford a fairly complete example of an outbreak of typhoid fever due to "insanitary" local conditions. It now appears, however, that on February 3rd, 1904, Mrs. H., the same woman who was in 1906 cook and dairymaid at Brentry, had been transferred from the Bristol Workhouse to assist at Grove House, Brislington, in the kitchen. She proved so satisfactory that on May 2nd she was taken on as a paid servant, with rations and lodgings. Her duties were to generally assist in the kitchen and to cook; she received the milk from the tradesman, and attended to its boiling and preparation for consumption by the children. All the milk was kept in the kitchen.

On May 16th the first case of typhoid appeared. Cases continued through June, July, August and September. The cook left to take a private situation on September 2nd.

(1) Annual Report of the medical officer of health (Dr. J. O. Heaven) to the Keynham Rural District Council, Somerset, for the year 1904.

The last case was notified twenty days after, on September 22nd, and the Home was closed at the end of September.

Quiescent Periods.—The occurrence of quiescent periods during which either no typhoid bacilli are extruded or, if extruded, fail to become effective, has been noticed by more than one observer. In this connection we may draw attention to the fact that both the Bristol outbreaks presented a period—at Brentry lasting from December to May, at Brislington from February to May—during which the carrier, although engaged in her usual occupations, proved ineffective; but from May onwards in each year the power of infection was markedly developed. This "close" time for typhoid carriers roughly corresponds to the seasonal incidence of typhoid prevalence in communities. As pointed out above, examination of Mrs. H.'s stools, which proved negative during November, gave a positive result on December 20th. In January, 1908, an examination proved negative, and three examinations of Mrs. H.'s dejecta during February, 1908, also failed to disclose the presence of the *B. typhosus*; it continued absent until the middle of April, when it was again demonstrated in the stools. Allowing for the normal incubation period of typhoid fever, the outbreak would probably have recommenced in May, as it did at Brislington in 1904, and at Brentry in 1907.

III.—COMMENCING OUTBREAK AT A CLIFTON HOME FOR GIRLS.

Another suggestive fact has been communicated to me by Dr. George Parker. On March 4th, 1905, Mrs. H. was taken on as cook at a children's home in Clifton, where there are thirty girls. Nothing happened until May 8th, when one of the girls duly developed typhoid fever, for which no reasonable cause could be found. Mrs. H. left at the end of April; no further cases occurred.

The recurrence of the May date as the period when infection commenced is quite remarkable, in conjunction with a similar experience in the other outbreaks associated with the same "carrier."

The Mechanism of Infection.—There is apparently little doubt that the transference of infection by carrier cases may be defined as "gross" and that definite, though minute, amounts of infective material are conveyed into the food or milk by the hand of the carrier

through carelessness and neglect to wash the hands after attending to the calls of Nature. Mittman has described in Virchow's *Archiv* [13] the finding of various micro-organisms, including bacilli, under the finger nails of schoolboys, waitresses, cooks, and others, and the subject hardly needs elaboration, though it suggests uncomfortable thoughts anent "our daily bread." It is significant that, although the proportion of convalescents from typhoid fever who become carriers is quite substantial (Klinger gives 1·7 per cent. and Lentz 4 per cent., while Savage [15] considers these figures too low), few, except those engaged in food preparation, achieve distinction; and that the two known outbreaks in the neighbourhood of Bristol were actually due, not to two distinct persons, but to the same cook-carrier. A. and J. C. G. Ledingham, however, found [12] that carriers not specially engaged in food work were occasionally effective.

Prophylaxis may obviously be directed to at least three points: (1) Revised criteria for determining recovery after typhoid fever and the adoption of a prescribed routine for registration of, and bacteriological control over, all convalescents; (2) meanwhile, self-defence indicates the necessity for greater care in selecting kitchen and dairy workers for home or institution. As in the eighteenth century servants were in request who had passed through the small-pox, so in the twentieth century the competence of a cook may justly include her incompetence as a "carrier"; (3) the urgency for stringent care as to hand cleanliness before commencing or resuming food preparation or dairy work is too obvious to need insistence; hand-washing drill should become a routine part of institution discipline.

Cure.—Unfortunately, the various drugs and intestinal antiseptics hitherto used have met with pronounced failure. Dehler (1907) has actually performed cholecystostomy and drainage of the gall bladder, which seems to be followed by gradual disappearance of the bacilli, and possible cure; but, as Ledingham pertinently observes, this treatment cannot be expected to become popular. Horton Smith suggested in 1900 (op. cit.) that typhoid bacilli in small numbers may be rapidly destroyed as soon as they come in contact with the other micro-organisms in the alimentary canal, for the toxins of not a few of them are extremely inimical towards the typhoid bacillus. Can bacterial methods be looked to for a solution

of the problem? Meanwhile, what is the legal status of a "carrier" capable of distributing disease and death? Are such persons

"suffering" from a dangerous infectious disorder, and can they be placed under any statutory restrictions?

TABLE I.—SHOWING TOTAL INMATES AND STAFF, ALSO ATTACKS AND DEATHS, BRENTRY, 1906-7.

		No.	Attacked.	Percentage.	Died.
A.—Inmates	Total Inmates, 240	105	11	10.4	—
		135	5	3.7	1
B.—Officers, including indoor attendants, police constables, and workmen engaged permanently or temporarily during the year	Resident, on full board	15	3	20.0	—
	Non-resident, partial board (tea-milk)	9	2	22.2	—
	Resident off premises, no food	19	3	15.6	1
	Resident off premises (workman), milk on one occasion only, September 28th, 1907, sickened October 14th, 1907 (denies drinking milk)	9	—	—	—
		—	1	—	—
		292	25	8.5	2
C.—Others...	Visitor (tea and cream) on one occasion only, tea party of July 31st, 1907, sickened August 20th, 1907	—	1	—	—
	Gardener's wife, lives at lodge, receives milk from Institution	—	1	—	—
	Police constable's wife, non-resident, probably contracted from husband	—	1	—	—
		—	3	—	—

To these may be added the doctor's little boy, who developed suspicious symptoms consonant with mild typhoid on June 20th (Widal negative).

The incidence is heaviest on the male and female officers on full board (including extra milk) and next on the non-resident male officers receiving tea-milk. The incidence on the female inmates was restricted to those who helped in food preparation or received extra milk, and on the male inmates to those who helped in food preparation (messroom attendants, having access to milk).

TABLE II.—LIST OF CASES OF TYPHOID FEVER AT BRENTRY.

Case.	Approximate date of sickening.	Sex.	Description of Patient.	How Employed.	Source of Infection.
1 N.B.	1906 Sept. 16	F.	Inmate	Kitchen	Extra (1 pint) milk for nursing
2 A.H.	Nov. 11	F.	"	—	No food but milk.
3 P.C.P.	" 11	M.	Officer (cottage)	Lives out	Lives in Lodge, receives milk
4 Mrs. E.	" 11	F.	Gardener's wife	—	Probably contracted from nursing husband
5 Mrs. P.	1907 Jan. 9	F.	Wife of No. 3	Lives out	Messroom maid
6 A. St.	May 4	F.	Inmate	Tea house	Extra (1 pint) milk for nursing
7 S. Sp.	July 4	F.	"	—	Messroom attendant 1
8 S. Sp.	" 4	M.	Baby	—	—
9 A.A.	" 11	M.	Inmate	Wing	—
10 A.R.	" 13	F.	"	Kitchen	—

TABLE II.—LIST OF CASES OF TYPHOID FEVER AT BRENTRY.—(continued).

Case.	Approximate date of sickening.	Sex.	Description of Patient.	How Employed.	Source of Infection.
11 E.L.	July 20	F.	Inmate	Tea house	Messroom maid; milk stands here from 2 p.m. to 4 p.m.
12 G.G.	" 26	F.	"	Pantry	Attendant on officers; dining-room maid 1
13 Miss H.	Aug. 8	F.	Officer	Kitchen	On full board
14 N.V.B.	" 8	M.	Carpenter	—	Gets board (officers' rations) 2
15 M.J.	" 10	F.	Inmate	Laundry	Extra (1 pint) milk for nursing
16 R.G.M.	" 13	M.	Officer	Lives out	Receives no food but milk; died
17 C.W.	" 20	M.	Inmate	—	Messroom attendant followed No. 9 in his duties
D. 18 H.R.	" 20	M.	"	—	Ditto, ditto; died
City 19 Miss C.	" 20	F.	Matron	—	Infected at tea-party, July 31st
" 20 Miss F.	" 20	F.	Visitor	—	Ditto
" 21 H.P.	" 27	F.	Inmate	Tea house	Messroom maid, followed No. 11 in duty here; milk stands here from 2 p.m. to 4 p.m.
22 W.W.	Sept. 19	M.	"	—	Attendant 1
" 23 E.C.	Oct. 14	M.	Stoker	Lives out	Only had one meal in institution, September 28th, 1907 (denies drinking milk supplied)
" 24 L.P.	" 31	M.	Engineer	"	Has milk occasionally to use for tea
25 A.W.	Nov. 7	F.	Inmate	Pantry	Attendant on officers; dining-room maid
26 S.B.	" 9	M.	Officer	—	Indoor officer, full board
27 Miss P.	" 13	F.	"	—	Ditto
28 A.S.	" 24	F.	Inmate	Kitchen and Scullery	—

1 Inmate attendants clear tables after food and have special access to food and milk.

2 Inmates receive an allowance of a quarter of a pint of milk daily, which is put directly into boiling tea in a large can; only inmate attendants have access to milk. Officers receive half a pint, part of which is used cold for porridge.

Total, 28 inmates ... { M. 5 } 16 Officers ... { M. 6 } 9
(including baby) ... { F. 11 } { F. 3 }

Also two officers' wives, one visitor, and (?) the doctor's little boy.

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TWO OUTBREAKS OF SCARLET FEVER RESULTING FROM INFECTED MILK.

By J. H. GARRETT, M.D., D.P.H.,
Medical Officer of Health, Cheltenham.

THE town had been comparatively free from scarlet fever for many months, and in the period from July 1st to September 4th, 1908, only four cases had been notified. From September 5th to the 8th, fourteen cases were notified in ten houses. Thirteen of the fourteen cases in nine of the houses were supplied with milk from the same milk shop, although the nine houses were scattered over a wide area of the town.

From the routine questions asked by the visiting inspector in every case as to the milk supply, a clear corroborative indication was thus obtained of the likelihood of the milk being the cause of the outbreak.

The milk shop was visited, and every person connected with the distribution of the milk, or residing on the premises, examined.

A boy employed about the place for part of his time, and who delivered the milk to two of the infected houses, was discovered to be suffering from scarlet fever, the rash being thickly out upon him, although he had delivered milk and been to school that morning. This case, however, had evidently begun too late to be the cause of the outbreak; it was almost certainly one of the cases of the outbreak, and not the cause.

The milk came from a farm situated six miles from Cheltenham, and in another district. This farm was visited. Here I was informed there had been two cases of scarlet fever within the previous month in a village situated within a mile of the farmhouse. The farmer's house was situated a quarter of a mile from the farm buildings, which comprised a good new cowshed, and a fairly good place for washing the churns, buckets, etc. The milk was not taken to the house. An epidemic of what was judged to be influenza was affecting everyone in the farmhouse excepting the farmer. There were the mother, governess, servant, and five children. All had, or quite recently had, sore throat and acute catarrhal symptoms. One child had a slight minutely papular rash on the backs of the arms and chest, which might have been taken or mistaken for scarlet

fever, but for the strong presumption that it was the same disease from which the rest of the family were suffering, and that was certainly not scarlet fever. The governess had returned from her holiday ten days' previously, and on the day of her return was very hoarse, had a sore throat and acute catarrh, from which she now appeared quite recovered. Her skin was quite free from desquamation. The mother credited her with having brought in the infection of a bad influenza cold, which was probably correct.

The farmyard was visited whilst milking was in progress, and the three men actually engaged in handling the milk were examined. One lived near by with his wife and three children. This family were all examined and were in sound health, and had no history of recent illness. The other two men lived together. One was a married man with one child, and the other had been lodging with him for a fortnight. This single man had previously been living in the neighbouring village where the scarlet fever had recently been notified. When he came to his new quarters he had a bad sore throat. His throat was still a little red, but there was no peeling of epidermis anywhere upon him. The married man said he had had a little sore throat as well as his wife, and his child had a tooth rash. This was the man who washed up the milk utensils, and brought the milk into Cheltenham. On visiting his cottage half-a-mile away, his child, fifteen months old, was found to be suffering from a fairly typical attack of scarlet fever, the body being covered with a fading rash, which was said to have been a brilliant red a few days previously, and the tongue was diagnostic.

I have no doubt that the infection which caused the outbreak in Cheltenham was derived from the people living in this cottage. The milk supply from the farm was stopped, and there were no more cases, all the cases notified, excepting one, having been sent into the isolation hospital. The diagnosis of the case in the person of the milkman's child was confirmed by the local practitioner, and sent into the isolation hospital of that district.

The other outbreak which I take the opportunity of recording here occurred a few years ago in very similar circumstances to the above.

REPORT ON PTOMAIN POISONING ARISING FROM POTTED TONGUES.*

By WILLIAM BERRY, F.R.C.S.I., L.R.C.P., D.P.H.,
Medical Officer of Health, Wigan.

INFORMATION of some cases of ptomaine poisoning existing in the practice of several medical men was received on the 16th of January. Inquiries were made, and every facility afforded us. It was found, in the first instance, that all the cases arose from one source, namely, from potted tongues sold by a butcher at one of the stalls in the Market Hall, Wigan. In every case in which this particular tongue had been partaken of, poisoning was produced, varying with more or less severity. The persons in the same house who had not partaken of this tongue escaped. It was bought on the 11th and 12th of January. The first cases we had information of was from a purchase made on the Saturday afternoon (January 12th), and eaten the same night. The symptoms appeared early in the morning of the 14th, thirty-six hours after consumption. These cases were severe, but the patients recovered after three or four days' illness. After this information the butcher's stall was at once visited, and a thorough inspection of the shop and cellar (in which the pickling had been done) was made, and the remains of the unsold tongue taken possession of. Unfortunately, the brine tub had been emptied and cleaned, so we got no brine. The tongue taken was becoming putrid and smelling.

The particular tongues in question were placed in brine on Thursday and Saturday (January 3rd and 5th), kept in three or four days, then taken out on the Tuesday (January 8th), boiled on Wednesday (January 9th), taken to the market on Thursday (the 10th), to be ready for sale on the Friday.

The particular beef tongues were put in tins, and the pigs' tongues into an enamelled tin.

Only two tins of beef tongue were made, and were sent to the market; and one tin of pigs' tongue; and these were sold only in the Darlington Street shop, along with half a remaining tin of beef tongue sent from the market.

The weight of each tin of beef tongue would be about 20lb.; the weight of each tin of pigs' tongue about 12lb.

The brine, in which the tongues were

At a time when scarlet fever was not otherwise prevalent in the borough, fifteen notifications were suddenly received within two days, all the houses affected being supplied from one milk shop. The milk was derived from a farm in an adjoining district, and on enquiry there, the boy engaged in washing the milk utensils was found in a desquamating condition, and with a history plainly proving an attack of scarlet fever.

The moral of these outbreaks points to the great use of taking careful note of the milk supply in every case of scarlet fever notified, as by such means collective and corroborative evidence of the cause of the disease may from time to time be obtained, and very definite measures of prevention brought into play, although habitual heating of the milk after its delivery at the customer's house is the only absolute means of insuring against the accident in its incipience.

General power appears to be required for the medical officer of health to inspect any place where milk is produced beyond the bounds of his district under such circumstances as those above recorded, and it should not be necessary to obtain a magistrate's order to enable this to be done, urgent and instant action on the part of the officer being required.

It would seem further to be required in a town such as Cheltenham that even wider power should be conferred to enable the local authority by their officers to visit and inspect the cows, premises and persons employed in milk production, at any place or farm wherever situate, that is supplying milk wholesale or retail to the town; and the outside wholesale milk purveyors might be called upon to obtain registration in the town to which they supply their milk, in the same way as would be required if they were retailers of milk or cowkeepers with places within the urban bounds. I am aware that registration of the outside milk purveyors is practised in some towns, but registration without powers of visiting seems to me to be useless, and the legality of the requirement is doubtful under the general order. They are all supposed to be registered and supervised by the councils of the districts in which they are situated, but the neglect of these councils in this regard is unfortunately well known.

* From a special report.

derangement, accompanied by abdominal pain, vomiting, diarrhoea and severe prostration.

In the light of past experience it seems rather hopeless to expect that the publication of the foregoing facts will have much effect in inducing the public to exercise a little ordinary common sense in regard to the purchasing of shell-fish. Of course it does not follow that everyone who eats sewage polluted shell-fish will contract typhoid fever, but assuredly, beyond any doubt, a certain percentage will contract the disease, and equally certain, in some of these the disease will prove fatal. It may perhaps help to emphasize the warnings already issued on the subject if I narrate the following little history:

In October I received a letter from Dr. R. W. C. Pierce, Medical Officer of Health of Guildford, stating that thirteen people in that town had been taken violently ill with vomiting, diarrhoea and great abdominal pain, and that four of these had subsequently developed typhoid fever. On making inquiries, he had ascertained that these people had all partaken of a parcel of butterfish that had been sent from Portsmouth to a person living at Guildford. As I was supplied with the name of the person who had sent them from here, I was able to trace the history of the butterfish. These (butterfish are a variety of shellfish somewhat like, but about three or four times the size of cockles) had been picked up off the bank about 300 yards west of the sewage outfall to which I have already referred, and sent to a person who had been staying at Portsmouth, and who had asked for some to be sent to him on returning to Guildford.

This case is instructive, as there was no other cause to which the outbreak of illness in Guildford could be attributed; the whole of the thirteen people who ate the butterfish were taken ill; in four of these the illness developed into undoubted typhoid fever, and in one case unfortunately the illness proved fatal. Moreover, the results must be attributed entirely to the sewage contamination; the fish were quite fresh when eaten, and in some cases were first well washed in salt water.

It seems that the only thing that can be depended upon to stop this loss of life is legislation, making it illegal to collect shell-fish from any places certified by local medical officers to be subject to sewage pollution. Otherwise men are sure to collect and hawk the fish from such places, and the public purchase them not knowing, nor apparently caring, what their previous history has been.

MUSSELS AND TYPHOID FEVER.*

THE Birmingham Corporation has recently published a valuable report on this subject by Dr. E. F. Buchan, the assistant medical officer of health of the city. During the past four years seventy-four cases have occurred in Birmingham in which there was a history that the patient had eaten mussels within four weeks prior to the onset of the symptoms. Sixty-two cases occurred during the height of the mussel season—from the end of September to January—while in eleven cases the onset was in February and March. The facts relating to these cases led to an inquiry into the possible sources of mussel pollution and the bacteriological evidence therefore. Mussels entering the Birmingham market from fifteen known sources—ten in England, four in Ireland, and one in Scotland—were examined. The condition of these sources is not dealt with in the present report, which is chiefly concerned with the evidence afforded by the bacteriological examination of mussels.

The method of examination was as follows:

After thorough cleansing of the mussel shells and of the hands, each of ten living mussels selected from a batch was opened with a sterile knife, cut with sterile scissors into very small pieces, and the whole contents of their shells (liquor, body and internal juices of the mussel) poured into a sterile cylinder of 1,000 cubic centimetres capacity. Note was made of the volume of the ten mussels in every case. The smallest volume noted was seventy-five cubic centimetres, while the largest was 250 cubic centimetres. The ten mussels giving a resulting volume of seventy-five cubic centimetres were received on 1st April, but the lateness of the season does not account for the small bulk, as the volume of ten mussels from a batch received earlier, on February 24th, from another source was only eighty-five cubic centimetres, while the volume of a like number received on 7th April from yet another source was 180 cubic centimetres. The average volume occupied by ten mussels worked out at 151.64 cubic centimetres for the twenty-five samples examined, and it is convenient to remember that a mussel of average size has a bulk of about fifteen cubic centimetres. The size of the mussel, however, affords no indication of its pollution. Having noted the volume, the ten mussels cut into small pieces were macerated with sterile water, and the volume was ultimately made up to 1,000 cubic centimetres with sterile water. Varying quantities and dilutions of this emulsion were used for the different processes concerned in the investigation.

The bacteriological inquiry may be divided into two parts, the first consisting of an enumeration of the total number of bacteria capable of growing at certain temperature, the second, and more important part, of a determination of the presence or absence of organisms known to be indicative of sewage pollution.

In the first part of the inquiry attention was

* Preliminary Report on Mussels and Typhoid Fever. By George F. Buchan, M.B., Ch.B. (Glasg.); D.P.H. (Camb.), Assistant Medical Officer of Health, Birmingham.

first directed to the number of colonies per mussel capable of growing on nutrient gelatin (reaction plus 1 per cent.) at room temperature (20°–22° C.).

Excluding one count, which was practically innumerable, the average of the gelatin counts was 964,000,000. In only six instances was this count exceeded, and Dr. Buchan thinks it justifiable to describe such mussels as containing an excessive amount of bacteria, and therefore unsafe. The lowest gelatin count, which was obtained in two instances, was 7,000,000. Dr. Buchan concludes that "mussels showing a less number of bacteria at 20°–22° C. than 10,000,000 per mussel may be regarded as very pure."

The number of colonies growing on nutrient agar (reaction plus one per cent.) at blood heat was then investigated. The highest count was 2,420,000,000 per mussel, and the lowest 2,000,000 per mussel. In only two cases did the number exceed 1,000,000,000, and Dr. Buchan concludes "that mussels exhibiting a greater number of bacteria per mussel than 1,000,000,000 capable of growing at 35°–37° C. in forty-eight hours are dangerous." The average agar count of all the samples was 182,000,000, and in only three instances was this number exceeded.

In the second part of the inquiry, special search was made for (1) *B. coli*, (2) *B. enteritidis sporogenes*, (3) *streptococci*, (4) *B. typhosus*. No organism was accepted as the *B. coli communis* which did not yield all the following reactions:—

1. Fermentation of glucose.
2. " " lactose.
3. Indol in peptone water.
4. Fluorescence in a neutral red medium.
5. No change in a saccharose medium.

For the better classification of the *B. coli* results, a numerical value was assigned to each test in accordance with the following scheme:—

Fermentation of glucose ...	= 2
" " lactose ...	= 2
Production of indol ...	= 1
" " fluorescence ...	= $\frac{1}{2}$
No change in saccharose ...	= $\frac{1}{4}$

A true *B. coli* of excretal origin would therefore have the value $5\frac{3}{4}$, and the more nearly an organism resembles the *B. coli* as above defined, the more nearly would its value approximate $5\frac{3}{4}$.

Dr. Buchan's results with *B. coli* are stated as follows:—

The presence of *coli* " $5\frac{3}{4}$ " or *coli* " $5\frac{1}{2}$ " may be generally accepted as strong evidence of pollution; eleven out of the twenty-five samples yielded one or other of these organisms. But it must not therefore be assumed that these eleven samples should be condemned, for it has been demonstrated that the *B. coli communis* may be found in shell-fish taken from layings remote from sewage contamination. The question of the number of these organisms present has to

be taken into account. In three of these samples the number exceeded 1,000 organisms of this type per mussel, and these must be described as polluted. Samples containing less than this number per mussel may be passed, but mussels containing less than 100 *coli* organisms " $5\frac{3}{4}$ " or " $5\frac{1}{2}$ " per mussel is the standard to be aimed at in the interest of the public health. If this standard were in operation, 7 out of the 25, or 28 per cent. of the samples examined would be condemned.

It is interesting to note that four samples, or 16 per cent., contained the true *B. coli*, or *coli* " $5\frac{3}{4}$ " as it is here called. Three of these samples were obtained from retail dealers in Birmingham, and this favours the view stated earlier in the present report, that mussels are liable to contamination during the process of keeping and "refreshing" in the retailers. The fourth sample, No. 25, was obtained from the same source as Nos. 11, 18, and 14, in which a " $5\frac{1}{2}$ " *B. coli* was found; Nos. 9 and 22, in which a " 5 " *B. coli* was found; and No. 17, in which a " 4 " *B. coli* was found. The gradation in the nature of the organism found in these samples, from the same source ultimately culminating in the true or " $5\frac{3}{4}$ " *B. coli* found in sample No. 25, shows that this is a laying occasionally liable to pollution, and therefore unsafe. These findings emphasise the necessity for inspection and control of the site of mussel beds.

In respect to the *coli* organism, " 5 " found in five of the samples examined, it shows only the main features of a true or " $5\frac{3}{4}$ " *B. coli*, and is certainly many generations removed from the original *B. coli* of excretal matter. It cannot be regarded as a serious sign of pollution from the point of view of the potentiality of the mussel as regards disease. It was not found in any great abundance in any of these samples.

With regard to *coli* organisms of less value than " 5 ," they all represent aberrant types of the true *B. coli*, and are to be taken into serious consideration only when occurring in excessive numbers. Such cases are exemplified by samples Nos. 10 to 1, which, however, yielded a " 4 " organism only. From the excessive number alone, it would appear that these mussels are derived from sources liable at times to more serious contamination, and therefore to be regarded as unsafe. It is also probable that the examination of a larger proportion of a mussel (say, an entire mussel) from one of these samples would disclose a *coli*-like organism of higher value.

Coli " 4 " may be accepted as the lowermost limit of a *coli*-like microbe. It presents only the group characteristics of this class of organisms, and is so remote from the parent *B. coli* of excretal origin, that its presence as an indicator of recent, and therefore dangerous contamination, may be disregarded. The same statement as regards contamination applies to organisms of less value. Indeed, it may be doubted if such belong to the *coli* group at all.

The importance of the *coli* group of organisms,

as regards faecal contamination, has been fully set forth, but unless the evidence obtained from the presence of members of this group justifies the assumption of gross pollution, as in the case of sample No. 23, it is undesirable to condemn a batch of mussels on this test alone, or indeed on any one test. The combined results of the various tests applied during the present enquiry have to be taken into full consideration.

Bacillus Enteritidis Sporogenes. This organism was sought for in every case. It was not found in one instance, and in the remaining twenty-four samples it occurred as follows:—

Thirteen samples contained between 10 and 100 spores of this organism per mussel.

Ten samples contained between 100 and 1,000 spores of this organism per mussel.

One sample contained between 1,000 and 10,000 spores of this organism per mussel.

Dr. Buchan regards more than 1,000 spores per mussel as evidence of serious pollution.

Streptococci were not found in five instances, and it is interesting to note that none of those five samples yielded any other appreciable evidence of pollution. Of the remaining twenty samples

8 yielded between 10 and 100 streptococci per mussel

5 " " 100 and 1000 " " "

6 " " 1000 and 10,000 " " "

6 " " 10,000 and 100,000 " " "

Dr. Buchan thinks that mussels containing less than 10,000 streptococci per mussel may be considered satisfactory.

B. Typhosus.—Diligent search in the case of every sample was made for the *B. typhosus*, but in no case was it discovered. In this enquiry, malachite green proved somewhat disappointing as a differential agent. The following experiment was made to ascertain the length of time typhoid bacilli may live in mussels: Twelve fresh and live mussels from Killorglin were put into a jar containing a large quantity of Birmingham tap water, to which a little salt had been added, on 20th February, 1908, and an agar slope culture of the *B. typhosus* (48 hours' growth) was added. One day afterwards, a mussel was withdrawn and found to contain many typhoid germs. A mussel was withdrawn each day up to the fourth day, when the mussels were found to be dead. In every instance, typhoid germs were recoverable from the live mussel. At varying intervals after this, up to the twenty-sixth day from commencing the experiment, a mussel (now dead) was withdrawn, and always found to contain typhoid bacilli in abundance. Although the conditions here are somewhat different to those found in nature, the fact is clearly shown that mussels exposed to specific contamination by typhoid bacilli can take up these germs and retain them for a considerable time. This experiment emphasises the need for protecting mussel layings from all possibility of sewage contamination.

A MIXED OUTBREAK OF SCARLET FEVER AND DIPHTHERIA DUE TO INFECTED MILK.

By R. W. C. PIERCE, M.D., B.Sc. Lond.,
Medical Officer of Health, Guildford.

THE following account of an outbreak due to infected milk may be interesting, on account of the fact that the milk appeared to have been charged with the germs both of scarlet fever and diphtheria, and also because of the fact that a second mixed outbreak was originated by the grandson of the incriminated cowman by direct transmission of the infection at school. It is also worthy of note that whilst there can be no reasonable doubt as to the identity of the majority of the cases with true scarlet fever, there appeared to have been an unusually large proportion of sore throats without rash—or, at any rate, without reported rash. The alleged absence of any rash in these cases may have been due to imperfect observation, or to the partial immunity conferred by a previous attack, or, of course, to infection by allied streptococci.

On January 17th, I was asked to see what proved to be a mild case of scarlet fever, and on January 18th, to see two other cases with practically simultaneous onset in another house. The latter were typical cases, and my help was sought more on account of the mystery attached to the origin than from doubts as to the disease. Both families lived in large houses and had nothing in common except the milk supply. The next cases (although the onsets were on January 17th and 18th respectively) were not notified until the 21st, and on finding that the milk supply in these instances was also derived from the same source, I visited the farm the same day. The following suspicious circumstances were found:—

(1) The man who took the milk round (W.C.) had an oedematous and somewhat congested throat, with a history of a cold and sore throat about three weeks previously, which, however, had not incapacitated him from work. He showed no peeling on any part of his body. His wife, moreover, had a sore throat about the same time, and one of his children, aged three, had malaise on December 21st, and a rash on December 22nd, which the mother stated lasted about two days, but no doctor was called in. The rash was described as patchy, and except for the fact that it followed the period of malaise, it could not

have been said to have been suggestive of scarlet fever. There was no sickness, no swelling of glands, but there was some thirst and a little difficulty in swallowing. The child showed no peeling on the 21st. It had not been exposed to known infection, but had accompanied the mother to the local hospital on December 18th, when she took another boy aged four for treatment on account of bad teeth. The mother's sister, however, who lived in London, had recently had scarlet fever in her family, and there had been some correspondence between them.

(2) One of the two cowmen (J. D.) who assisted in the milking, owned to a recent slight cold, and one of his daughters had been at home for a fortnight to recuperate after having been in an isolation hospital for three weeks with diphtheria.

(3) One of the cows in the milking herd had sores on her teats. On one teat was a partly separated brown scab about half-an-inch in diameter, and having underneath a raw and moist but not depressed surface. At the side of it was a vesicle of about the same diameter containing clear fluid. Each quarter of the udders of the cows in the herd, thirty in number, were milked separately into a white saucer with a view to the detection of purulent or discoloured milk, but no abnormality was detected except the presence in two instances of slight ropiness in the first milk obtained.

As it was impossible at the time to determine which of these possible sources of infection had been at work, it was decided, with the ready concurrence of the farmer, to remove any further risk by forthwith excluding both men from participation in the handling of the milk, and by separating the cow from the herd and using her milk separately. The source of infection was evidently included in one of the three mentioned, as, allowing two days for the incubation of scarlet fever, no further primary cases were infected after this date, whereas altogether fourteen cases (one of fatal diphtheria) were notified up to the 23rd. In addition there were at least eight houses where cases of sore throat without rash were reported.

Dealing further with the three possible sources, nothing corroborative subsequently transpired in the case of the milkman (W.C.); neither he nor any of his family showed any peeling. He had not assisted in the milking, but was employed entirely on the round, and

distributed the milk from the milk cart by means of cans. The round was a good one and consisted almost entirely of large houses. Although this man appeared at first to be the most suspicious source, the difficulty presented itself of the improbability that mere handling of the milk in the open air was sufficient to infect the milk to such an extent, that at least twenty-two households out of fifty-three supplied, became infected within a few days. It appeared more probable that the contaminating matter entered the milk in considerable quantities, and this seemed more likely to occur from the exudation from the sores on the teats being washed into the milk during the process of milking. Moreover, whilst the milkman (W.C.) first complained of sore throat about December 21st, the first case of scarlet fever did not occur till January 17th.

Returning to the sores on the cow's teats—on January 25th, the sore under the scab had apparently healed, and a thin scab had formed on the site of the vesicle. A similar scab was found on the 24th on another teat, but this had disappeared on the 26th, leaving an oval moist surface about one-half by three-quarters of an inch, the longer axis being vertical. The cows were examined on behalf of the farmer by a veterinary surgeon, who reported he had "found two cows suffering from the very common eruption of their teats, known to dairy-keepers as pimply or scabby teats. In this condition there are first a crop of papules; in a few days these soften, the epithelium covering them is pulled off in the process of milking, leaving a superficially ulcerated surface, the irritation being kept up by the milking twice daily. In dry cows, the subjects of this eruption, the papules are not broken, and in a few days a scab forms, and in a few days more the scab comes off, leaving a healthy surface underneath already covered with a new epithelium. I do not think there can be any possible connection between this condition and scarlet fever."

Samples of the milk from each teat, and swabs from the sores, and also from the throats of three of the cases and the milkman (W.C.), were sent on February 1st to an expert bacteriologist, who found the milk free from streptococci, although one quarter (not the one with sore teat) showed a very high leucocyte count. The growth from the teat ulcer yielded two kinds of colonies only—streptococci and staphylococci. The strepto-

cocci were long chain forms, and were all, or nearly all, alike. The only one then tested was highly pathogenic to a mouse; and this organism was practically identical in cultural characters with the organism prevalent in the growth from the throat of the milkman (W.C.) (this was, however, also pathogenic to a mouse), and of one of the patients (G. P.). Different forms were found in the swabs from the two other patients.

Reverting now to the third possible source, viz., the cowman (J. D.), there was nothing suspicious about the man himself, and he only owned to having had a cold in the head a little time previously. The grown-up daughter, who, as previously mentioned, had been at home since January 7th, after having been in hospital for three weeks with diphtheria, was due to return to her situation next day, and after an examination which revealed no abnormality of the throat, and no peeling, she was allowed to return. No swab was taken from her throat, as at that time there was no suspicion that the milk was conveying the germs of diphtheria. Questioned as to having any rash whilst in hospital, she stated that she had had only the usual nettlerash following the injection of antitoxin, and the short period of her detention proves that any cross infection with scarlet fever was not suspected. The medical officer of the hospital informed me that she had not had scarlet fever whilst in hospital, and that she was free from infection when discharged, although apparently no bacteriological examination was made. The cowman denied that any illness of any sort had recently occurred in his family, and his wife and two grown-up daughters appeared to be perfectly well.

So far, only cases of scarlet fever have been mentioned, but on January 20th, a severe case of diphtheria was notified on the same milk round. The diagnosis was confirmed by bacteriological examination, and the case proved fatal. The patient was a young girl, who, being somewhat of an invalid, had not been outside the premises for some weeks, so that any other source of infection was extremely unlikely. Several cases of sore throat without rash were reported, but in only two instances, other than the fatal case, did the signs appear sufficiently suggestive of diphtheria to warrant the taking of swabs by the doctors in attendance, and in these no Klebs-Löffler bacilli were found.

Coming now to the second outbreak of

mixed cases, I received on February 4th, notifications of two cases of scarlet fever in one cottage, in a village in a neighbouring district, and not far from the dairy farm. On visiting the house it was found that four other children had been confined to bed with sore throats without rash, during the preceding fortnight, and these had shown no peeling. The school attended by the children was then visited, and the children examined. A boy aged seven was found with a suspicious sore nose, and who on further examination showed some peeling on the upper arm and in the axillae. A swab taken at the time from the nose showed Klebs-Löffler bacilli in great numbers. He was at once excluded, and it then transpired that he was a grandson of the cowman (J. D.) and lived with him, although I had not previously been made aware of his existence, and he had happened to be at school during my visits to the cottage. Reference to the school registers proved that this boy was absent during the school week, January 13th to 17th, and again absent from January 24th to 31st. Three suspicious cases of scarlet fever (not notified) occurred among the school children during the week following the days on which he returned to school, viz.: January 20th to 24th. Further cases of scarlet fever were notified among the school children on February 5th and 7th, and cases of Diphtheria on the 7th and 9th. Two boys living next door to the cowman (J. D.), but who attended another school were notified as suffering from scarlet fever on February 6th. It was now admitted by the cowman and his wife, that the boy suffered from a cold a few days subsequent to the return home of the daughter from hospital on January 7th, and he was at any rate unfit to attend school on the 13th. They also now admitted that the two other grown-up daughters had colds in the head about this time. One of these had left by February 4th, but the other showed suspicious peeling on the hands and feet on February 5th. Next door neighbours stated that they saw very little of the family for the week or so following the return home of the daughter, and altogether there is little doubt that every effort at concealment was made. Swabs were taken from the cowman's throat on February 5th, and diphtheria bacilli found by the bacteriologist to whom the other specimens had been submitted, although I was myself unable to detect any.

The probabilities, therefore, are that the

cowman became infected with the germs of scarlet fever and diphtheria (possibly whilst suffering from a cold in the head) directly or indirectly from the grown-up daughter returned from hospital. It is interesting to note that the cowman was subject to colds in the head, and that whilst so suffering, drops of clear mucus constantly formed at the tip of his nose. (The information as to this peculiarity was volunteered to me by a fellow workman.) Obviously, if these were infected, they would by dropping into the pail during milking, supply that substantial amount of infective matter, which it appears reasonable to assume must have found its way into the milk. It should be added that the milk was not cooled before distribution.

The cowman asserts he never milked the cow with the sore teats, otherwise there would remain the possibility of these sores becoming inoculated, and acting as breeding grounds for the specific germs of the two diseases.

It may be added that any doubts that were originally entertained as to the identity of the disease with scarlet fever were subsequently removed by the occurrence of several secondary cases (no less than four cases having occurred at considerable intervals in each of three houses), and by the sequence of free desquamation, and the common complications of the disease.

Of the primary milk cases two were under five years of age, three were from five to ten, four from ten to fifteen, one from fifteen to twenty-five, and four from twenty-five to thirty.

MILK POISONING OUTBREAK AT YOULGREAVE.—On Friday, August 28th, upwards of thirty persons were seized with violent sickness and diarrhoea. There was also much headache and depression. The temperature varied from 102 to 104. No death occurred. On investigation it was ascertained that all the persons seized had their milk from the same dairy, and that a cow calved on the previous Sunday (August 23rd.) had her milk added to the usual supply on the Wednesday and Thursday, and that all the cases occurred within the next day. The cow had been sold, as I am informed, previous to calving, but was not delivered until the Thursday evening. No fresh outbreak occurred after her removal to Elton, from where she was taken to Bakewell Market on the following Monday and re-sold, when she was lost sight of. The cow was believed to be healthy by the dairyman, for he not only partook of the milk, but also his wife and child, with a similar result. Unfortunately we were unable to have a bacteriological examination, as no sample of the milk could be obtained.—*Special report by Dr. John Knox, Medical Officer of Health, Bakewell Rural District.*

COUNTRY SCHOOLS, SCHOOL CAMPS, AND OPEN AIR SCHOOLS.

By H. L. P. HULBERT, M.B., D.P.H.,

School Medical Officer, Northamptonshire, late Assistant

Medical Officer to the Manchester Education Committee.

Ludi Magister, parce simplici turbae.

* * * * *

Ferulaeque tristes, sceptrum paedagogorum

Cessant et Idus dormiant in Octobres:

Æstate pueri si valent, satis discunt.

M. Val. Martialis, x. lxxii.

IT was the privilege of the present writer in the early summer to see hundreds of the poorest school children from the towns on the Lake of Geneva, scattered over the Elysian fields above Les Avants, picking the *Narcissus poeticus*; to watch a large Jesuit boys' school climb the Dent de Zaman with their masters, and glissade down the snow slopes on their descent; to dine with the cosmopolitan scholars of an Armenian school who were taking their annual week's tour on the Alps. Such holiday excursions are worth much schooling, and might well have their counterpart more often in England; but the object of the present paper is to show how much can be done by means of schools to secure for English town children a more free and open, and therefore a healthier life, during part of the year at all events. Two Manchester examples will be taken first, and will show how this may be combined with great educational advantages.

I. *The Manchester Country School for town children.*—A detailed account and plan of this school will be found in a paper read at the recent International School Hygiene Congress. Only the main facts concerning it need here be stated.

The school provides a fortnight's education in the country, with board and lodging, for selected groups of children from the Manchester elementary schools during the summer months.

It is situated at Knoll's Green, in Cheshire, sixteen miles from Manchester, in the midst of well-wooded pastoral country. It is built on five acres of land, acquired at a peppercorn rent through the David Lewis Trustees, and is surrounded by gardens.

In addition to the absolutely necessary accommodation for children, their teachers

and the permanent staff, a bath-room containing ten shower baths and a bath for the staff has recently been completed.

Every child at the school during the present season has thus been enabled to have at least one bath during its residence there.

When possible, the children take their meals in a play shed, open at the sides, and covered by a corrugated iron roof, and are then practically in the open air. The total cost of the building furniture, laying out of the grounds and water supply up to the beginning of the 1907 season, has been £3,000. This is exclusive of the bath-room, which is the gift of one generous donor.

The permanent staff consists of:—

A matron and her daughter, who acts as assistant.

Two female servants.

One gardener who is also teacher of } out
nature study } of
One general workman } doors.

Three or more teachers (one for every forty children) accompany each party.

The diet is practically unrestricted, and almost incredible amounts of food are disposed of by some of the children. It has been impossible to obtain exact quantities.

Both boys and girls are requisitioned in the kitchen as "potato peelers," "bread cutters," etc. The children wash up for themselves, make their own beds and sweep the dormitories. The matron assures me that the rudimentary knowledge of these necessary accomplishments, which most of the children possess, is perfected by a fortnight's stay at the school. This is of more use to the children than much of the information laboriously acquired during eight years at a school desk.

The daily rambles in the fields and country lanes are a characteristic feature of the country school life. These are quite free and easy. The children have abundant opportunity for making discoveries for themselves in the fields and hedgerows. Attention is drawn by gardener or teacher to the characteristic features of the trees, flowers, and animals encountered.

The children are taught to listen to and distinguish the songs of the birds. Bees have been kept at the school, and their hives and habits demonstrated. In the mornings systematic lessons in natural history prepare the way for the afternoon rambles.

The weighing machine, once aptly described by a farm bailiff as "that dumb judge which tells us the truth," has given on the whole, satisfactory results during the last two seasons. During the present season, from April 27th to October 3rd, 1,232 children have visited the school. Of these, 824 are recorded to have gained 1,549·5 lbs., making an average gain in weight per child gaining weight of 1·9 lbs., 181 are recorded to have lost weight. Of these, twenty-seven came from one school and ninety-one from another. Thus, 118 out of the total of 181 who lost weight, came from two schools only, and these figures must be discounted as anomalous, pending further inquiry. It will probably be found either that some mistake has been made during the weighing, or that some slight illness occurred during the visit of these particular children. The weights have been kept for each batch of children visiting the county school during the past two seasons, and in the absence of a medical officer at the school from a delicate indication of the condition of the health of the children while there. A wet fortnight always tells upon the weights of the children, and a transitory epidemic of summer diarrhoea which occurred during last season had a much more marked effect. Dr. Brown Ritchie, medical officer to the Manchester Education Committee, has kindly provided me with this season's figures at the time of writing, but they still await further investigation.

Twenty-five different school departments have sent children to the school during the present season. The children and teachers of different schools meet there to their mutual advantage. Boys and girls visit the school alternately.

The average cost per child, including railway fares, during its stay at the school is 11/9; each child has to contribute 7/- towards this amount. Exclusive of capital expenditure, it is calculated that if the school could be extended to include 500 children, it would be self-supporting.

Among the advantages found to result from the school are:—

1. The introduction of new interests and pleasant memories into the lives of the children at an impressionable age.
2. No loss of school attendance (the school is recognised by the Board of Education).
3. The education afforded by life in a community.

4. Fresh air after town or slum life, regular habits and meals, adequate and undisturbed sleep, result in marked improvement in the health and appearance of the children.

II. *School "Camps" from the Fielden Demonstration Schools, Manchester.*—The Fielden are experimental schools, under the direction of Professor Findlay, in connection with the training of teachers at Manchester University, at which the children pay a small school fee. Experiments in school camps have now been conducted from them for the past three years.

In 1906, three boys and nine girls, between the ages of eight and fourteen years, camped out on the side of a hill near Marple, with one mistress and two students. These were followed by sixteen boys at a later period. They did all their own domestic work and cooking and no attempt was made to teach the children set lessons. The camp seems to have been more of a picnic than a school. In her report of the visit, Miss M. G. Findlay, head mistress of the primary school, writes:—

"A marked effect was visible during the remaining week or two of the term, nerves were steadied, self-control greater, and a new readiness to help in practical ways was manifested. . . . The sum charged to each child (10/-) covered all expenses, including the few pence of the railway fare for teachers and children, and left us with a balance of 23/- in hand."

Next year, 1907, it was determined to develop the experiment on a larger scale, and to make use of the educational advantages afforded by a school migration to the country. The upper school sent thirty boys (aged 10-16) with three masters, and the primary school twenty-nine children (aged 6-11) with six mistresses to the Holiday Home, Great Hucklow, in a most remote and beautiful part of the limestone district of Derbyshire.

A more fitting place could scarcely have been chosen for such an experiment. It is approached by a road curving between the precipitous rocks of Miller's Dale; it is within a few miles of the historic Parish Church of Tideswell, rich in fine wood carving and old brasses; it is situated in an open situation with a wide view of a mountainous country and few houses in sight; it is within a day's excursion of Haddon Hall and some of the interesting Derbyshire caverns. The weeks preceding the visit to Great Hucklow were used to prepare for it. The preparation took tangible form in a book produced by the boys,

the contents of which include:—"Flora and Fauna of the District," "Geological Notes," "Historical Notes," "Survey Map," and "Notes on the Weather Record." The children were sent "back to the land," to learn their history, geography and science.

The Time Table as given in this book was as follows:—

- | | |
|-----------|---|
| 7. 0 a.m. | —Rise. |
| 8. 0 " | —Prayers. |
| 8.30 " | —Breakfast. |
| 9. 0 " | —Science Records. |
| 9.30 " | —Lesson or Excursion. |
| 1. 0 p.m. | —Dinner. |
| 2. 0 " | —Lesson or Excursion. |
| 5. 0 " | —Tea, followed by play, letter writing, entering up diaries, etc. |
| 8.30 " | —Supper. |
| 9. 0 " | —Concert or bed. |
| 10. 0 " | —Bed. |

The lessons frequently took the form of careful drawing and painting of flowers and leaves, picked up by the children, either on account of their beauty or botanical interest. A diary was carefully kept by every child of sufficient age to do so.

In connection with such a programme as the above, it is important to note that the school hygiene of boarding school has been much neglected in this country. Dr. T. D. Acland has shown that the hours of sleep are insufficient in thirty-five of forty of our best English public schools. If country schools for town children are to produce the best possible results, such a point must be carefully attended to. Other problems and difficulties will also arise. For instance, a condition of over excitement and overstrain, likely to be produced by suddenly placing a child in new and strange surroundings, has to be avoided. We all know the exhaustion produced by wandering aimlessly through a museum. A child may suffer from the same complaint if left too long to its own resources in strange surroundings. The best preservatives seem likely to be regular hours and regular, if fewer, indoor lessons. The latter are of use because concentration prevents distraction. The solution, however, of these and many other difficulties, can only be the result of progressive experiments, such as those which have been made with so much enterprise by the Knoll's Green Committee and the staff of the Fielden Schools.

Following the example of Germany, much

stress has been laid on the selection of delicate children by school doctors for open-air treatment. An "open air" school is becoming a technical phrase for a school for such children like Charlottenburg Forest School, the L.C.C. school at Bostall Woods, and the Bermerside "Open Air" School, recently started by the Halifax Education Committee.

Might not such schools be started on a larger scale for normal children, who might thus be trained up from infancy to a more open-air life? Delicate children might be admitted with the rest, and special provision made for the rest and feeding which they require under the supervision of the school medical officer. Public parks and open spaces might be used for such schools, and the cost of the necessary shelters and offices need not be great.

The Fielden Schools have just moved into a large house surrounded by gardens, and it is hoped that these may be used for some such purpose, though the damp climate of Manchester will be a disadvantage less acutely felt elsewhere. In conclusion, it is scarcely necessary to remind the readers of PUBLIC HEALTH of the encouragement promised to all such schools when properly conducted by the provisions of Section 44 in the Board of Education's code for 1908.

REFERENCES.

1. Quoted in School Excursions and Vacation Schools. Board of Education Special Reports on Educational Subjects. Vol. xxi, p. 21.
2. On the Hours of Sleep at Public Schools: T. D. Acland, M.D., J. and A. Churchill.

SCHOOL HYGIENE IN FRANCE.—APPOINTMENT OF SPECIALISTS AS MEDICINAL INSPECTORS.—The Prefect of the Gironde sanctioned the appointment, on the 17th August, 1907, of Dr. Régis, Professor of Mental Disease in the Faculty of Medicine, as special medical inspector of the schools of the town of Bordeaux. His duties comprise the medical inspection of children for nervous affections, and, in particular, the medical inspection of classes and schools for abnormal children. At the same time the township of Bordeaux appointed a special medical inspector for each of the important branches of medicine and surgery of children; for Nose and Throat conditions, Professor Mouse; for Skin Conditions, Professor Dubrenith; Eyes, Professor Cabannes; Teeth, Dr. Dunogier; Surgery of Infants, Professor Deaucé; Orthopædics, Dr. Gourdon.—(*Le Progrès Médical*).

SCHOOL ATTENDANCE OF CHILDREN UNDER FIVE.*

THE Board of Education have recently published the report of the Consultative Committee appointed by the Board "to consider and advise them in regard to the desirability or otherwise of discouraging the attendance at school of children under the age of five years." The committee found that during the last fifteen years or so at least one-third of all the children in England and Wales between the ages of three and five were on the registers of public elementary schools. From time to time, however, various medical men and students of education had expressed the opinion that a public elementary school was not a proper place for such young children, and after the passing of the Education Act in 1902, some of the new authorities began to consider the question. The Board of Education also made investigations, and in 1905 published the report of five women inspectors on the position of children under five in public elementary schools. The result of these inquiries was that in the Code for 1905 the Board of Education left it open to any local education authority to refuse admission to their schools to children under five.

To ascertain the actual practice of the various authorities, the Committee issued a form of inquiry, which was circulated to every local education authority in England and Wales. The report which is now published is based on the information gathered from the written replies of the education authorities, from the evidence of specially qualified witnesses, and from the reports by special investigators on the practice of foreign countries in this matter.

The Committee have arrived at the conclusion that there are many children in this country between the ages of three and five for whose care and education some public provision should be made, and that the objections urged against the attendance of such children at school are not valid, provided that the school is organized on proper lines. How such a nursery school should be organized and

* Report of the Consultative Committee upon the school attendance of children under the age of five. Printed by Wyman & Sons, Fetter Lane, E.C. Price 1s 5d.

equipped is described very fully in the report. In the evidence of the special witnesses who appeared before the Committee, much interesting and valuable information is to be found on ventilation and heating, school infection, school curricula and apparatus, training of infants' teachers, and other subjects bearing on the question. In addition, there are some valuable reports on the provision made for little children in Belgium, France, Germany and Switzerland.

The more important recommendations of the Committee are given in full below.

1. The proper place for a child between three and five is, of course, at home with its mother, provided that the home conditions are satisfactory.
2. Under existing economic conditions, however the home surroundings of large numbers of children who attend elementary schools are not satisfactory in this sense, and children from these homes should be sent during the daytime to places specially intended for their training.
3. The committee consider that the best place for this purpose is a nursery school, such as is described in the body of the report. On the grounds of educational advantages, economy, and convenience of administration, the committee consider that, so far as provision by a public authority is concerned, such nursery schools should, as a rule, be attached to public elementary schools. Private institutions, however, if under public inspection, are desirable in certain circumstances, and under certain conditions.
4. With respect to children under five who are admitted to school, it is essential that they should not be subjected to any mental pressure or undue physical discipline, and that the premises in which they are trained should be roomy and well-lighted warmed and ventilated.
5. Formal lessons in reading, writing, and arithmetic should be rigidly excluded from the curriculum of younger infants, and also everything that requires prolonged complex operations of the nervous or muscular systems. Freedom of movement, constant change of occupation, frequent visits to the playground, and opportunities for sleep are essential.
6. In assessing the amount of school accommodation necessary for the many younger infants for whom public provision should be made, the industrial and social conditions of the area should be considered, so that no obstacle should be raised to the admission of children whose home conditions are not yet satisfactory.
7. The local authority, in the first instance, should estimate the number of children for whom nursery school accommodation ought to be provided, and see that the required provision is made. Should the authority, however, desire to restrict the accommodation, an appeal, to be made either

by parents or by minor authorities, should lie against their decision to the Board of Education.

8. In the greater part of most towns and urban areas, the majority of children who will eventually attend an elementary school should be regarded as eligible for admission to nursery schools when they are three years old. In some country districts, where the population is small and scattered, the authority could hardly be compelled to make such provision owing to the prohibitive cost. Each case, however, should be considered on its merits, and younger infants should not be excluded when the population is sufficiently concentrated to make a nursery school practicable and necessary. On the other hand, younger infants must not be admitted to school when their presence interferes with the instruction of older children.

9. The educational care of younger infants presents difficulties at least equal to those which arise in teaching older children, and the teachers for them should be selected with scrupulous care. The best teacher will be one who has made a careful study of the physical and mental development of childhood, and who has a sympathetic and motherly instinct, and a bright and vigorous personality.

In view of the extreme importance of training children in cleanly habits at an early age, nurse-attendants or school-helps should be provided to attend to the general physical needs of the children. Such attendants, however, must be in addition to, and not in place of, the teacher.

10. The present size of infants' classes should be reduced. No teacher should be put in sole charge of more than thirty younger infants at once. A teacher, however, who had the assistance of a school-help might be allowed a rather larger class.

12. As regards premises, financial considerations may prevent the immediate or universal construction of nursery schools. But the committee do not think it is impracticable to demand a great improvement in the near future. All new buildings for infants should be framed on the lines suggested in the body of this report. In the case of existing buildings, an effort should be made to improve them as quickly as possible, so that at least the proper amount of light, ventilation, and space is secured. Galleries, where they still remain, should be abolished at once. Heavy desks should also give place to light chairs and tables, and generally any unsuitable equipment should be replaced by more appropriate apparatus as early as possible.

14. The committee do not recommend any change at present in the lower age limit, either of voluntary or compulsory attendance at school.

15. Lastly, the committee strongly recommend that the Board of Education should appoint a body of experts to make a thorough and conclusive inquiry into the question of the impurity of the air in public elementary schools, and the best methods of heating and ventilation.

THE MODES OF INFECTION IN TUBERCULOSIS.

PART three of vol. 60 of the *Zeitschrift für Hygiene und Infektionskrankheiten*, which has recently been issued, contains an interesting series of articles on the modes of infection in tuberculosis.

The first article is on the "Significance of contact infection in the spread of tuberculosis, especially in childhood." By contact infection, the author means the conveyance of tubercle bacilli to the mouth by "comforters," kissing, getting the fingers infected in dirty rooms where patients are spitting about, using dirty drinking vessels, etc., as distinct from inhalation. To arrive at the significance of these modes of infection, the author, Dr. H. Osterman, examined washings from the hands and dirt under the nails in various members of twenty phthisical families in Breslau, specially chosen on account of their poverty, the bad hygienic conditions of their dwellings, and gross carelessness in disinfecting sputum, etc. In ten of these the dirt on the floors was also examined for the tubercle bacillus. The washings were taken and injected into guinea-pigs with the usual precautions.

In the first series of experiments with hand washings, one child in thirty-one was found to have the tubercle bacillus, and in the second series, three in eleven. The great percentage of positive results in the latter is explained by the experiments having taken place in winter when the children spend much more time in the house. As regards the floor washings, ten tests were made with thirty guinea-pigs; eight died prematurely, and of the twenty-two which remained alive and were inoculated with dry dust, two became tuberculous; and of five others which were inoculated with moist material, two became tuberculous. As a result, the author is inclined to think that we must somewhat narrow our conception of the frequency and significance of contact infection; though he admits that in a relatively few cases of great poverty and dirt, children may become infected by tubercle bacilli carried by the fingers. In such cases the bacilli do not necessarily come from the floor, but from dirty pocket handkerchiefs and clothes. It is also only when one excludes inhalation of the tuberculous spray produced by the coughing of consumptives, that much significance should be laid on contact infection.

As regards the examination of the hands of adults, the author found tubercle bacilli in seven cases on the hands of fourteen phthisical adults, and once on a nurse in attendance. He made very interesting experiments as to the probability of the tubercle bacillus being spread by hand shaking, etc., and also as to whether they were conveyed easily to the mucous membrane of the mouth and nose by touching these parts with the infected fingers. On the whole, he does not consider the danger of these two methods of spread very serious.

In an article on "Experimental inquiries on the mode of entry of the tubercle bacillus,"

Prof. H. Reichenbach, of Breslau, describes his experiments on guinea-pigs and goats to find out the relative importance of inhalation or swallowing in production of tubercular infection. Forty thousand bacilli, introduced in the form of a fine spray, produced infection by inhalation in guinea-pigs, and on the same animals it took a minimum of 140 million bacilli (3,500 times as many) to produce infection by feeding. In goats, too, it took a 500 times greater dose to produce infection by feeding than by inhalation. Other experiments were carried out as to feeding with small repeated doses, and also by shutting off of the nasal cavity.

The author concluded that infection by inhalation is quicker and more certain, and takes place with much smaller doses than by feeding. This result is to be ascribed to the bacilli that go direct into the lung tissue and not to those which reach there either through swallowing during inhalation, or by being taken up by the lymphatics of the nose and throat.

Dr. J. Alexander, Assistant at the Hygienic Institute of the University of Breslau, carried out a similar set of experiments to the last, using rabbits, and also different types of the tubercle bacillus. Like the last experimenter, he found the ease with which infection took place enormously in favour of inhalation as against feeding. The bovine type was much more virulent towards these animals in the inhalation experiments, but the difference was not so marked in the feeding. There was not much difference in the virulence of cultivated types and those taken direct from sputum. Rabbits approach nearer man as regards their susceptibility to the bacillus than guinea-pigs.

Dr. Ballin, of this same institute, carried out a very interesting series of experiments with the inhalation of spores of fungi, to find out, by analogy, the fate of the tubercle bacilli when inhaled, viz., as to whether they were arrested in the bronchi or reach the alveoli. These spores were chosen as they could be easily found from both before and after development. As a result, he found that whether inhaled as spray or dry, they went direct into the alveoli; that in a short time they penetrated the partition wall of the alveoli, the avirulent a little slower than the virulent; that the development always takes in the partition wall, and never in the alveoli themselves. He thinks it is safe to conclude from these experiments that tubercle bacilli can at least penetrate straight into the alveoli.

Dr. Bruno Heymann carried the last series of experiments further, and endeavoured to discover the fate of inhaled tubercle bacilli in the lungs of guinea-pigs. The experiments were done with a Findels spray apparatus, and great care was taken to have the bacilli finally and evenly divided in the solution. The experiments were so conducted that the approximate number of bacilli inhaled could be calculated. There were three series of experiments: in the first, the inhalation lasted ten minutes; in the second, five minutes; in the third, fifty minutes; and the number of bacilli inhaled in the first series was 10,000, in the second, 100,000, and in the third, 1,000,000.

After the inhalation was finished the animals were killed in 1, 12, 24, 3 × 24, 6 × 24 hours respectively, and the lungs carefully examined biologically and microscopically for tubercle bacilli. The results were interesting. In series one, the lungs, even to the periphery, contained tubercle bacilli after inhalation of one hour and upwards, while the bronchial glands only showed them after three days; and a curious circumstance is that they disappeared again from the latter after six days; series two gave the same results; series three, in which 1,000,000 bacilli were involved, gave similar results, except that the bronchial glands contained tubercle bacilli an hour after inhalation and did not get rid of them again. Microscopical examination also proved that tubercle bacilli can penetrate into the finest bronchi and alveoli, viz., direct to the spot where the formation of tubercle can begin.

In the Institute for Hygiene, Breslau, Dr. Köhlisch carried out a very important series of experiments on dried sputum dust. He set himself to find out first the exact percentage of dust which reached the finest branches of the air passages, and the number of bacilli which on reaching them are able to infect. His general conclusions are that dust infection has been considerably over-estimated, for he shows that for dust to infect readily, certain conditions must be fulfilled which do not often occur, viz.: (1) Tubercular sputum in a handkerchief or on the floor must be *completely* dried; (2) It must be *very finely* pulverized; (3) Dust from this source when raised very soon settles, and the infection must therefore take place during its actual disturbance; and (4) Tubercle bacilli must be present in the dust in great numbers. Dr. Köhlisch claims that these experiments afford evidence that the fine infected spray ejected into the atmosphere during the act of coughing of phthisical patients is much more dangerous than infected dust.

THE DIFFICULTIES OF MEDICAL OFFICERS OF HEALTH.—At a recent meeting of the St. Just (Cornwall) urban district council, a letter was read from the Local Government Board relating to the report of the medical officer (Dr. R. G. Nesbitt) on the recent outbreak of enteric fever at St. Just and Boscawell. The Local Government Board stated that it regarded with great dissatisfaction the continued inaction of the council, which by its prolonged delay in providing a wholesome water-supply for the district and neglect in other matters of sanitation, was incurring grave responsibility. The Board urged the council to take into earnest consideration the medical officer of health's recommendations in regard to the water-supply and other sanitary matters. One of the members accused Dr. Nesbitt of "raising a hornets' nest about their ears," and moved a proposition, which was carried, that the Local Government Board should be informed that the council is endeavouring to obtain a supply of water for St. Just and the district.

A CASE OF BROMIDE POISONING AFTER VACCINATION.*

By H. MEREDITH RICHARDS, M.D., B.S.,

Medical Officer of Health, Croydon.

A BABY, born August 22nd, 1906, was unsuccessfully vaccinated by one of the public vaccinators on January 4th, 1907, and again (successfully) on January 12th. The vaccination ran an entirely normal course, but on January 24th the infant was noticed to have "spots" on his forehead. These spots increased in number, and spread to the rest of the body, and, as the child's appearance was very unusual, I was asked to see him on February 5th. On the same day I saw him with Dr. Puddicombe, and found that, while the vaccination scabs were normal, there were scores of vesicle pustules (little pimples containing watery matter) on the head, face, and legs, some of them being grouped, though mainly scattered, while on the chest there were a few scaly papules where the pustules had apparently cleared away. From the appearance of the eruption we suspected bromide poisoning, but the mother denied that the child had had any other medicine than three cooling powders. A similar powder was thereupon examined, but with a negative result. As the condition was puzzling and of some interest, I communicated with the Local Government Board, and visited the child on February 7th with Dr. Copeman. On that occasion the mother immediately confessed that she had misled us on the first occasion, and that, as a matter of fact, the child had had a convulsion, for which she had been advised to "give it a little bromide." She thereupon bought two-pennyworth of bromide at a chemist's, and made a watery solution, of which she had given the infant daily doses from January 7th to about January 28th. I obtained what was left of this mixture and submitted it to the analyst. It was found that no less than 180 grains had been administered during the three weeks to the infant, a quantity quite sufficient to have produced poisoning.

On February 7th the lesions on the face and head were much as before, but those on the leg were larger and more papular, being of the size of a small lentil, red in colour, and somewhat elastic. A few of these papules or modules had pustular heads, and others were dotted with yellow points the size of a pin's head. I again saw the child on February 11th, and found the condition much as before, except that some of the lesions were disappearing, and about a dozen fresh ones had appeared on the limbs. The trunk was still free from eruption. The vaccination scars were normal.

My attention was not drawn to the child after this date, but I understand the eruption gradually disappeared, as would have been expected. Unfortunately the infant succumbed to meningitis and convulsions on April 29th, 1907.

*From the Annual Report on the Health of Croydon, 1907.

A MUNICIPAL LETHAL CHAMBER FOR ANIMALS.*

By PHILIP BOOBYER, M.D.,
Medical Officer of Health, Nottingham.

THIS lethal chamber, in which dogs, cats, and other small animals are painlessly killed, by placing them in a wire cage and lowering the cage containing them into an atmosphere of chloroform vapour and carbonic acid gas, is still worked by the Health Department on behalf of the Watch Committee. The chamber is usually worked only on Monday and Friday afternoons, but it is also operated at other times when the number of animals awaiting destruction is sufficiently large. Persons interested in animals sent down for destruction are invited to witness the operation, which is altogether free from offensive features. The animals on entering the lethal atmosphere appear to fall suddenly asleep.

The total number of animals destroyed in this apparatus during 1907 was the largest annual number since the opening in 1898. The dogs destroyed numbered 1,531, 1,291 being brought in by private persons, and 240 by the police. The cats were 531 in number. The totals of dogs and cats in 1906 were 1,448 and 428, respectively.

A fee of one shilling per animal is charged for the destruction of animals from outside the City. The sum of two pounds nine shillings was received in such fees during 1907.

The animals annually destroyed since the opening in 1898 have been as follows:—

	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907
Dogs	422	472	731	770	568	1078	1325	1507	1448	1531
Cats	64	108	180	297	371	455	735	548	428	531

* 2 monkeys, 3 rabbits, and 1 bird also destroyed during 1907.

PRESERVATIVES IN MILK AND CREAM.—At the Kingston County Police Court, on October 1st, Messrs. T. H. Moon and Sons, dairymen, of Surbiton, were summoned for selling cream which was not of the nature, substance, and quality demanded, being adulterated with boric acid to the extent of 0.27 per cent., or 19 grains to the pound. Mr. G. C. Whiteley, barrister, said that dairymen might add a limited quantity of boric acid as a preservative, provided notice was given to the purchaser of the fact. In this case no such notice was given, and the general effect of the use of boric acid was that it enabled stale cream to be sold to customers, who thought they were getting pure, fresh cream. Mr. Edward Hincks, county analyst, said boric acid was itself injurious, and even a small quantity was deleterious to children and invalids. The defence set up was one of warranty, and it was shown that the defendants never used boric themselves. It was also contended by Mr. Sherwood, who defended, that the quantity was too minute to be injurious. The magistrate imposed a penalty of £1 13s., including analyst's fee and costs.—At the same Court, Frank Hanson, dairyman, of Thames Ditton, was summoned for selling milk containing boric acid to the extent of 2½ grains per pint, and he was fined £1 9s., including costs.

* Annual Report, 1907.

REVIEWS.

ELEMENTS OF WATER BACTERIOLOGY WITH SPECIAL REFERENCE TO SANITARY WATER ANALYSIS. By C. S. Prescott and C. A. Winslow, of the Massachusetts Institute of Technology. John Wiley and Sons, New York; Chapman & Hall, London. 2nd edition, 1908. Small 8vo. pp. 258.

This little book retains the convenient size of the first edition, but the actual text has been increased from 127 pages in the first edition to 216 in this the second edition. Part of the extension is due to the addition of a chapter upon the Bacteriology of Sewage and Sewage Effluents. A useful list of references is appended. The principles which underlie the bacteriological examination of water are carefully discussed, and while many of the numerical tables and other data adduced to illustrate these principles are naturally taken from American sources, the work of English and continental investigators is by no means neglected. Although written by American workers the conclusions arrived at are in accordance with those reached in this country, and the practical procedures only vary in unessential particulars. For example, following the American Committee on standard methods (1905) the use of sodium chloride is abandoned in media, and fresh meat is advocated in preference to meat extract. In this country meat extract is frequently, if not generally, used. Gelatin plates are counted after forty-eight instead of seventy-two hours, as is more commonly practiced in England, while dextrose broth is preferred to bile-salt broth for *B. coli*. These are minor matters and, in general, agreement is close. The authors strongly recommend the enumeration at body temperature, and regret that the American Committee failed to adopt this method in their last report. As they point out, it was recommended by the English Committee which reported in 1904. In connection with this estimation the use of litmus lactose agar is advocated. The chapter on the interpretation of the quantitative analysis, while giving a good deal of information, is not very helpful practically. The significance of *B. coli* is discussed in considerable detail, and credit is given to the labours of English workers upon the distribution of this bacillus, Houston being particularly mentioned. They remark: "In America, the fact that the number of colon bacilli in a water measures the degree of its pollution, is now universally accepted." While the general significance of *B. coli* is insisted upon, and also the importance of its numerical presence, insufficient help is given as to its exact interpretation in particular instances. For example, its varying numerical significance in different classes of waters is not clearly explained. The very important question of the significance of atypical colon bacilli is only slightly dealt with. The use of streptococci as indicators of sewage contamination is recommended, but most workers will be disinclined to agree with their statement that "the isolation of these organisms either from plates or liquid cultures is easy." On its practical side as a

laboratory guide the book is weak. It is lacking in practical details and precise guidance. Methods are given and the general composition of the media to use are mentioned, but not in sufficient detail to enable them to be prepared. For example, the well-known agar of Drigalski and Conradi is mentioned, but no information as to how to make it is supplied; the same applies to Endo's fuchsin agar and malachite green agar. In spite of these defects, however, the book will be found useful by those wishing to obtain clear ideas as to the principles upon which the bacteriological examination of water is based.

THE LATE DR. ORME DUDFIELD.—At the first meeting of the Kensington Borough Council, after the summer recess, the following resolution was unanimously passed: "That this Council and their several Standing Committees, having learned with profound regret of the death of their esteemed Medical Officer of Health, Dr. T. Orme Dudfield, after a period of service extending over thirty-seven years, desire to place on record their deep sense of the loss which has thereby befallen the Royal Borough of Kensington and the metropolis generally, their recognition of the whole-hearted zeal and devotion which he has ever displayed in the performance of his important municipal duties, and their high appreciation of the invaluable work which he has accomplished during his long and honourable official career in the interests of the public health, the promotion and furtherance of improved methods of sanitary administration, and the introduction of many and far-reaching reforms conducive to the health and happiness of the community. That a copy of the foregoing resolution be forwarded to the widow and family of the deceased gentleman, with an assurance of the sincere sympathy of the Council and their committees with them in the sad bereavement which they have sustained." Councillor McArthur, in moving this resolution, said: "Dr. Dudfield energetically performed his duties up to the time of his last illness. He was as full as ever of new schemes for the promotion of the health and happiness of the community, still eager to fight the forces of disease, poverty and vice. He was 'ever a fighter,' and when 'the one fight more, the best and the last,' came upon him, he faced it with the old courage and the old cheerfulness. In the early stages of his illness he wrote cheering notes to us of the Health Committee, in which he looked forward to taking up his work again. It was not so to be. The longest of days draws on to its evening, and for Dr. Dudfield the night was at hand when no man can work. If, in the closing days of an active life, it is a consolation for a man to review his past, to recognise in all modesty that he has not buried his talent in a napkin, that he has been true to himself, and that in so far as in him lay he has laboured for the good of his suffering fellow men, has striven to leave the world a little better than he found it, then you will agree with me that such a sense of consolation cannot have been wanting to him who has gone from us."

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856. RECONSTITUTED, 1888.
INCORPORATED, 1892.

ANNUAL GENERAL MEETING.

THE Annual General Meeting of the Society of Medical Officers of Health was held at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, 9th October, 1908. Present: Dr. George Reid (retiring President), Dr. Edward Sergeant (President-Elect), Drs. Joseph Priestley, H. W. Roberts, H. E. Armstrong, Professor Sheridan Delépine, Sidney C. Lawrence, F. E. Cane, W. A. Bond, G. B. Millson, W. H. Symons, J. Howard Jones, F. R. Smith, G. F. McCleary, Theodore Thomson, Wm. Butler, Reginald Green, E. H. Snell, C. R. Macdonald, W. F. Brown, J. T. Neech, W. F. Dearden, Alfred Greenwood, T. W. N. Barlow and Herbert Jones.

DR. GEORGE REID (retiring President) having taken the chair, said that before vacating his position, he desired to express his sincere regret at having been unable to carry out his duties as President. He had no doubt that the meeting would understand how painful it was to him to look back upon practically a whole year of office of which he had been deprived, owing to his unfortunate illness. One pleasant duty, however, remained for him to perform, and that was to induct Dr. Edward Sergeant into the Presidential chair. Dr. Sergeant had been known to him for some twenty years; he knew of no one more worthy to fill the position of President of the Society, and was convinced that the Members of the Society would never have occasion to regret their choice. Dr. Reid then invested the President-Elect with the presidential collar, and vacated the chair.

DR. EDWARD SERGEANT, having taken the chair, in thanking the Members for having elected him to the office, said that he found it difficult to express all he felt at that moment. He remembered those who had filled the presidential chair in the past, and he could only say that he would do his best to follow in their footsteps. With the support of the Members, he would use his best endeavours to further the interests of the Society. He was very proud of the fact that he had been inducted by Dr. Reid, and he could assure him that the deepest sympathy of every Member had gone out to him during his serious illness. It was indeed a pleasure to see Dr. Reid back amongst them in good health.

DR. H. E. ARMSTRONG, in proposing a hearty vote of thanks to the past President, said that Dr. Reid had ever upheld the dignity of the profession of a medical officer of health. Nothing that he could say could increase the high esteem in which he was held by every Member of the Society. He was very glad indeed to see Dr. Reid in such excellent health after his illness, and trusted that he would long be spared to support the Society.

DR. G. B. MILLSON (Hon. Treasurer) seconded the motion, which was passed with acclamation.

DR. REID, in expressing his thanks to the meeting, placed on record his indebtedness to his predecessor in the chair, Dr. D. S. Davies, for having undertaken the presidential duties during his illness.

MINUTES:—It was resolved that the Minutes of the last Annual General Meeting having been printed and published in PUBLIC HEALTH for November, 1907, be taken as read, be confirmed, and they were duly signed by the President.

ACCOUNTS AND BALANCE SHEET:—On the motion of the Hon. Treasurer it was resolved unanimously that the Accounts and Annual Balance Sheet of the Society to September 30th, 1908, as submitted to the Members, be received and approved.

ANNUAL REPORT OF COUNCIL AND OFFICERS:—Resolved that the following Reports of the Council and Officers be received and printed in PUBLIC HEALTH.

REPORT OF COUNCIL.

SESSION 1907-8.

1. Your Council are again able to present a satisfactory report dealing with the work of the past Session, 1907-8. When the Society was incorporated in 1891, there were 387 Fellows, and there are now 787. The total Membership of the Society is 934, and includes 34 Hon. Fellows, 753 Fellows, 47 Associates. During the year under review, 4 Fellows have died, and 15 who have ceased to hold office as Medical Officers of Health, have resigned. There were newly-elected during the year 95 Fellows, and 5 Associates—the yearly averages for the previous ten years being 64 and 10 respectively.

2. Your Council regret to have to put on record the deaths of Dr. W. T. G. Woodforde and Dr. T. Orme Dudfield, former Presidents of the Society.

3. An able and instructive address was given by the President, Dr. George Reid, dealing with "The Planning of Schools, with special reference to their ventilation."

4. At the meetings of the Society, the following subjects were dealt with:—

(a) "Disease Prevention in the Territorial Army, with a proposed scheme for placing Medical Officers of Health in relation to it," by Sir Alfred Keogh, K.C.B.

(b) "On some of the results of the Re-housing Operations in Liverpool," by Dr. E. W. Hope.

(c) "Some observations upon Disinfection," by Professor Kenwood.

(d) "Isolation Hospital Expenses," by Dr. Sidney Barwise.

(e) "The Garden City, Rural Housing and the Government," by Dr. F. E. Fremantle.

5. The Annual Provincial Meeting was held on

June 27th, 1908, at Glasgow, when a Paper was read by Dr. A. K. Chalmers, upon "The Growth of Cities in Relation to Town Planning."

6. Your Council have received with great regret the resignation of Dr. Arthur Newsholme as Editor, and have recorded in their Minutes their high appreciation of the valuable work carried out in connection with the Journal by Dr. Newsholme during the period that he held the position of Editor.

7. Your Council report that they have appointed Dr. G. F. McCleary, as Editor of the Journal.

8. Your Council report that they have appointed Dr. William Butler as Hon. Librarian.

9. Your Council report that they have elected as official Auditor of the Society, for a second year, Mr. John Hamp.

10. Your Council report that they have terminated their contract for printing *Public Health* with Messrs. John Wright & Co., of Bristol, and that they have arranged to increase the size of *Public Health* by 16 pages monthly, in order to include a section dealing with School Hygiene—the size of the publication being altered to demy quarto, beginning with the March, 1908, number of the Journal.

11. Your Council report that a special Committee was formed during the year for the purpose of assisting the formation of the Sanitary Organisation of the Territorial Force, on the lines suggested in a Paper read by the Director-General of the Army, Sir Alfred Keogh, before the Society, and that the Committee have met and submitted to the Director-General of the Army the names of Medical Officers of Health specially qualified in connection with the Scheme of Sanitary Organisation of the Territorial Force.

12. Your Council report their satisfaction at the honour conferred by His Majesty upon Sir W. H. Power, F.R.S., on his retirement from the position of Chief Medical Officer to the Local Government Board.

13. Your Council report, with much pleasure, the appointments to two important Government Departments, of two Fellows of the Society, as Chief Medical Officers, viz.: Dr. Arthur Newsholme, as Chief Medical Officer to the Local Government Board, and Dr. George Newman, as Chief Medical Officer to the Education Department.

14. Your Council report that they have received from Dr. Newsholme a complete set of the reports of the late Dr. Joseph Groves, for use in the Library of the Society.

15. Your Council report that the Articles of Association of the Society have been altered in a variety of details, dealing *inter alia* with:—

(a) *Pro ratâ* direct representation of Branches on the Council,

(b) The appointments of all Hon. Secs. of Branches as *ex officio* Members of the Council.

(c) The powers of the Council to pay travelling

expenses of Branch representatives when attending Council and Committee Meetings in London,

(d) The closing of the Society's books on September 30th in each year,

(e) The alteration of the name of the Society to "The Society of Medical Officers of Health," etc., etc., etc.

16. Your Council report that they have arranged for an extra meeting of the Council to be held yearly on the same day as the Annual Meeting of the Society, for the purpose of election of Committees.

17. Your Council report that they have elected a Public Health Bill Committee, and have approved the resolution of that Committee to the following effect:—"That endeavours be made to get inserted into the Housing and Town Planning Bill a clause embodying the principle that a Medical Officer of Health, who is not engaged in private practice, shall not hold office for a limited period, but shall be dismissible by the Electing Authority, with the assent of the Local Government Board."

18. Your Council report that they have approved of the following principles:—

(a) That there should be no registration or burial without a certificate stating the cause of death from either a qualified medical practitioner or coroner after inquest;

(b) That a compulsory form of death certificate be prescribed, that death be verified before certification, that the medical certificate of the cause of death be sent *direct* to the Registrar under cover, and that such certificate should be paid for out of the National funds;

(c) That the certificate for burial given by the Registrars of Deaths be retained by the officials of the cemetery, and returned to the Registrars of Deaths after the interment.

19. Your Council report that they have re-appointed Dr. T. Orme Dudfield to act as the Society's representative on the Sanitary Inspectors Examination Board, for the year 1908-9, and Dr. Reginald Dudfield to act as the Society's representative on the Worshipful Company of Plumbers' Registration Committee in London.

20. Your Council report that they appointed during the year Delegates to the following Congress:—

(a) Royal Sanitary Institute, Cardiff, 1908.

21. Your Council report that they wish to put on record the valuable services rendered by the Executive Secretary, Mr. W. A. Lawton, Barrister-at-Law, in connection with the work of the Society.

REPORT OF THE HON. TREASURER.

To the Council of the Society of Medical Officers of Health.

GENTLEMEN,

In criticizing the Balance Sheet and Accounts presented for Session 1907-8, it should be borne in mind that it covers the period from 1st July,

1907 to September 30th, 1908, owing to the alterations made in the Articles of Association. This makes it difficult to give a comparative statement as in former years, but taking into consideration the fact that £35 less in subscriptions was received, and that the grants made to branches are £25 in excess of the amount previously paid, it is obvious that the credit balance of £17 15s. must be considered satisfactory. It is also satisfactory to note that the payments from the advertising department have increased considerably. It is clear, however, that there is no margin for increased expenditure in any department of the Society at present. It will also be noted that the rent payable by the Society has been more than covered by the amounts received for letting.

The fact that 100 new Members have been elected during the past Session, speaks well for the future of the Society.

I am, Gentlemen,

Yours faithfully,

G. B. MILLSON.

The following Amounts are outstanding:—

	£	s.	d.
Anthony Bros., Ltd.	24	5	9
Editor	19	7	4
Rent, September Quarter	43	15	0
Hon. Solicitor	2	12	6

Due to the Society, exclusive of petty cash:—

	£	s.	d.
Reprints	47	11	4
Publishing	20	0	0
Advertising Department	55	12	0

9th October, 1908.

REPORT OF EDITOR.

To the Council of the Society of Medical Officers of Health.

GENTLEMEN,

My work as Editor of PUBLIC HEALTH practically began in January last, when I was entrusted with the preparation of the February number, upon the resignation of my predecessor. Since that time PUBLIC HEALTH has been considerably enlarged, and there has been a corresponding increase in the work devolving upon the Editor. The enlargement of PUBLIC HEALTH was due to the decision of the Society that additional space should be devoted to the subject of school hygiene—a subject which has greatly increased in importance from the administrative point of view during the past year. Since I have acted as Editor I have endeavoured to give special prominence to school hygiene, and especially to the aspects of the subject that are of immediate practical importance to those engaged in administrative work. Unfortunately I have not yet received many original contributions on this subject, but I hope that in the present year, Members of the Society will make a fuller use of the opportunities the Journal affords for communicating the results of their experience to their colleagues.

My object as Editor is to follow the example of my predecessors in making PUBLIC HEALTH, in the

words of my immediate predecessor "a reflex of the best work in Public Health Administration in the country." This object, however, cannot be attained by an Editor who does not devote practically the whole of his time to the work, unless active assistance is given by members of the Society. I receive a large amount of highly interesting and important Matter in the form of special and periodical reports, extracts from newspapers, journals, etc., and much of this I am obliged to leave unnoticed from want of time to condense it for publication. The usefulness of PUBLIC HEALTH would be considerably increased if matter of this kind were presented in a form suitable for immediate publication in the Journal.

I am glad to acknowledge the assistance I have received from Mr. W. A. Lawton, the Executive Secretary, in his capacity as sub-editor.

I am, Gentlemen,

Yours faithfully,

G. F. McCLEARY.

October 6th., 1908.

The following Candidates having been duly nominated were balloted for, and the President declared them to be unanimously elected:—

AS FELLOWS.

Martha Adams, M.B., Ch.B., D.P.H., 9, Park Terrace, Twickenham. William George Armstrong, M.B., Ch.M., D.P.H., Town Hall, Sydney, N.S.W.; Sydney C.D. Miles Bracewell Arnold, M.D., Ch.B., D.P.H., Public Health Offices, Blackburn; Blackburn C.B. (Assist.) David Arthur, M.D., D.P.H., 5, North Common Road, Ealing, W.; Ealing S.M.O. Hy. John Blacker, M.B., D.P.H., Redhill, Surrey; Reigate S.M.O. Lewis D. Cruickshank, M.D., D.P.H., 10, Belgrave Terrace, Aberdeen. Edward J. Day, M.D., M.R.C.S., Dorchester; Dorchester M.B. Edward Guy Drudbury, M.D., B.S., D.P.H., Grahamstown, Cape Colony; Albany, Cape Colony. H. R. R. Fowler, B.A., M.D., D.P.H., Broadwas, Worcester; Worcestershire S.M.O. Catherine Fraser, M.B., Ch.B., D.P.H., 6, Westminster Road, Handsworth, Staff.; Aston Manor S.M.O. George Fogg, L.R.C.P. & S.E., 24, Eldon Square, Newcastle-upon-Tyne; Newcastle-upon-Tyne S.M.O. Robert A. Glegg, M.D., Ch.B., D.P.H., 286, High Street, Lincoln; Lindsey Lincoln C.C.C. W. R. Griffin, M.D., D.P.H., 30, Upper Bedford Place, Russell Square, W.C.; Aliwal North. Wm. Habgood, M.D., D.P.H., Municipal Offices, Sutton, Surrey; Sutton U.D. Thomas F. Hanley, L.R.C.P. & S.E., Gillingham, Dorset; Shaftesbury R.D. Wm. E. Henderson, M.A., M.B., Ch.B., Kendal, Westmoreland; Westmoreland S.M.O. James R. Hutchinson, M.B., Ch.B., D.P.H., Town Hall, Manchester; Manchester C.H. (Assist.) James Johnson, L.R.C.P. & S., Lord Street, Blackpool; Bispham U.D. S. Fox Linton, M.B., Ch.B., B.Sc., Monsall Hospital, Manchester. Murdoch Macdonald, M.D., D.P.H., Town Hall, Huddersfield; Huddersfield S.M.O. Mary E. H. Morris, M.B., 18, Pulteney Street, Bath; Bath, S.M.O. Charles Murray, M.A., M.D., D.P.H., 53, Trinity Road, Wimbledon, S.W. Andrew N. Stevens, L.R.C.P., M.R.C.S., D.P.H., 14, Princes Road, Great Yarmouth; Great Yarmouth C.B. (Assist.) Robert R. Stitt, L.R.C.P. & S.E., Town Hall, Bootle, Lanes.; Bootle S.M.O. Percy H. Stirk, L.R.C.P., M.R.C.S., Education Offices, Exeter; Exeter S.M.O. John Tate, L.R.C.P., D.P.H., 26, Ferguson Road, Holloway, N.; Middlesex S.M.O. Telford Telfordsmith, M.A., M.B., D.P.H., Wimborne, Dorset; Dorset U.D. Ernest Watt, M.D., D.P.H., Renwick, Garfield, Bothwell, Lanarkshire; Lanarkshire (Assist.) Alfred E. White, M.B., D.P.H., Wellington, Salop; Wellington U.D.

AS AN ASSOCIATE.

Ernest E. Argles, L.R.C.P., M.R.C.S., 74, Oxford Terrace, Hyde Park, W.

Southern Branch.—Quarterly Meeting held at the Municipal Offices, Southampton, September, 23rd, 1908. *Present:* Drs. Lauder (President), Cameron, Gibson, Griffith, Howard, Lyster, Legate, Nunn, Parkinson, Sheppard, Stott, Willoughby, with Dr. R. H. Wilshaw as visitor.

Dr. LAUDER took the chair as President for the year 1908-9, and thanked the members for electing him to the office.

The minutes of the previous meeting having been confirmed, and there being no other business, the President read his address on the History of the Development of Public Health Work, with special reference to the inspection of school children.

A discussion of the various points referred to was carried on by several of the members; and the opinion was expressed that the inspection of school children resulted in more work for the general practitioner rather than less; the greatest difficulty encountered was in dealing with parents who neglected the notices sent them by the school medical officer, and additional powers were needed in this direction.

A vote of thanks was heartily given to the President for his address, after which the members had an excellent lunch (provided by the President) at which His Worship the Mayor of Southampton joined them.

A visit was then paid to the port hospital ship lying in Southampton Water.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

ANNUAL DINNER.

THE Annual Dinner of the Society of Medical Officers of Health took place in the Balmoral Rooms of the Trocadero Restaurant, Piccadilly Circus, on Friday evening, October 9th. Dr. Edward Sergeant (the President) occupied the chair, and there were also present:—

Mrs. Sergeant, Sir James Crichton Browne; Professor Delépine, of the Victoria University, Dr. Tatham, Mr. and Mrs. Searles-Wood, Sir Shirley Murphy and Lady Murphy, Dr. H. E. Armstrong, Dr. H. B. Collins, Dr. S. C. Lawrence, Dr. Sowden, Dr. R. A. Lyster, Dr. James Kerr, Dr. J. A. H. Brincker, Dr. Charles Porter and Mrs. Porter, Dr. Musgrave Craven, Dr. Snell, Dr. Harold Coates, Dr. and Mrs. Crookshank, Dr. and Mrs. W. A. Bond, Dr. J. A. Gibson, Dr. R. K. Brown, Dr. H. Cooper Pattin, Dr. W. F. Browne, Dr. C. R. Macdonald, Dr. Alfred Greenwood, Dr. George Reid, Dr. and Mrs. Coutts, Dr. J. Howard Jones, Dr. W. J. Butcher, Dr. W. H. Symons, Dr. and Mrs. G. B. Millson, Dr. Lennane, Dr. Mrs. and Miss Priestley, Dr. Corbett, Dr. J. T. Neech, Lieut.-Col. Davies, Dr. Dearden, Dr. Hamilton, Dr. and Mrs. Wm. Butler, Dr. and Mrs. Reginald Green, Dr. T. N. Barlow, Dr. Clarke.

The loyal toasts having been honoured,

SIR JAMES CRICHTON-BROWNE, F.R.S., proposed "The Society of Medical Officers of Health." He

said *The Times* had declared the other day—and he thought *The Times* was deserving of the gratitude of all medical officers of health for the steady and consistent support it gave to all sound sanitary reform—that sanitation was really a kind of war, and required money, discipline, organization, and thought. It was (said Sir James) for the Government to provide the money, for the local sanitary authorities to enforce the discipline, and for the medical officers of health to supply the organization and thought. They (the medical officers) were the brains of the campaign and its right hand. It was to the medical officers of health that we mainly owed many of the most important recent advances in public medicine, which, notwithstanding many counterbalancing and adverse conditions, were contributing to the improved health, and, therefore, to the increased prosperity of the people. He would not by one iota detract from the merit of those public men, and lay officials to whom it was given to propound and promulgate novel life-saving and health-saving measures, but whenever he heard of some new and admirable hygienic proposal emanating from a Minister of State, which secured universal approval, he knew there was behind it some insignificant medical officer of health or some paltry Local Government inspector. (laughter). Medical officers of health were the real interpreters of science. They were engaged in a great public work, and it was to them that we would owe the alleviation of that great burden of infirmity and incapacity under which we groaned and laboured. He had sometimes thought that Tennyson's vision of the golden future, expressed in "Locksley Hall," was incomplete, and that the poet failed to recognise the important part that medical officers of health would play in the consummation of that vision. It ought to have included this stanza:—

Saw the puking tribe of infants
Free from intestinal strife,
And a host of fell diseases
Flying from the cleanly life.

(applause). He was confident that there was no section or branch of medicine that had an ampler conception of its duty or loftier aims, than that with which those who were engaged in safeguarding the public health were connected. Of the sanitary improvements that had lately been introduced into this country, there was none more important or promising than that which had secured the medical inspection of school children. (Cheers). That Act, if followed up by suitable remedial measures, would relieve future generations from a part of that heavy burden of infirmity and incapacity to which he had referred. He felt that the medical inspection of school children rightly fell within the department of the medical officer of health, for the care of the eyes, the ears, the teeth, the skin, the glands, and the general health was a medical and not an educational function. Mentally defective children, wherever circumstances rendered it practicable, should be withdrawn from the ordinary schools. (Hear, hear). They were not merely defective; they were infective to a certain extent. They were subversive of discipline, they spread demoralization

around them, and they deterred the educational development of the other children. Therefore, where their numbers permitted, it seemed desirable that they should be collected into separate schools, where they could have the benefit of individual treatment and guidance. They were, in most cases, curable, and where not curable they were improvable. For the pronounced defectives—the idiots, the low-grade imbeciles—institutional treatment of a permanent nature was essential. But he did not see why the minor defectives and simply backward children should be withdrawn from that general system of school medical inspection which was being instituted at great cost, and why, as the Royal Commission recommended, they should be put under special medical officers appointed by the lunacy committee of the district. He desired that these backward children should be free from any association with lunacy; they should be kept in touch with the general medical inspection of the schools, and remain under the medical officers of health, with, of course, special additions to their staff of specially qualified persons capable of dealing with them. That, no doubt, would be publicly considered and discussed. It was one of the encouraging features of the times that health questions were now discussed wisely and fully in the daily Press, and that the work of medical officers was engaging widespread attention. They could not take up a newspaper to-day that did not contain the word "tuberculosis" in large letters—(laughter)—and many of the articles on that subject were of a highly educational character. Widely as they respected the work of Koch, they might still rejoice that at Washington he was, so to speak, placed into an isolation hospital on the subject of the identity of bovine and human tuberculosis. At Washington, Dr. Koch stood, he believed, almost alone on that subject, and his views, which might, had they passed unchallenged, have done great harm, had been refuted largely by the work of the British Royal Commission (Hear, hear). He trusted that the work of that Royal Commission would not be interrupted or brought to a premature close (Hear, hear). It would be a thousand pities if their elaborately-equipped laboratory and experimental farm were broken up, and if this band of expert investigators were dispersed at a time when a score of problems—problems which could not be adequately tackled by private investigation—connected with tuberculosis still awaited solution. The fight with tuberculosis was not over, and as it approached its close, new difficulties would arise, and new weapons, which could only be forged by means of experiments, would be required to meet those difficulties. He therefore trusted that the President of the Local Government Board would not persevere in his idea of putting an end to the Royal Commission. (Hear, hear). He would now return to his toast. He had had the privilege for a number of years of being more or less associated with the Society of Medical Officers of Health, and fully recognised the great energy displayed by the Society and its increasing power. It was a remarkable fact that year by year they produced an excellent and admirable President to step into

the place of his predecessor. They had that evening as their President, Dr. Sergeant, who presided wisely, judiciously, and ably over the health affairs of one of our greatest and most populous English counties, and who was, as he knew from his own observation, doing most excellent work. He remembered, many years ago, reading an admirable paper by Dr. Sergeant, in advance of the views of that period on milk as a vehicle for the conveyance of disease, and he was exceedingly struck by the way in which their president then dealt with this primarily vital fluid. In addition to his official work, their president had contributed largely to the progress of public medicine and sanitary science. He had much pleasure in coupling Dr. Sergeant's name with the toast. (Cheers).

The PRESIDENT, who was received with cheers, said his task in responding to the toast was lightened inasmuch as they had with them that evening the presidents of four of the branches of the Society, each of whom would address them. The examination of children in schools, to which Sir James Crichton-Browne had referred, was a matter upon which they, as professional sanitarians, had been labouring for a great many years, and at last they had succeeded in obtaining more than they had ever contemplated. This examination would be of the greatest importance, not only to the children themselves, but to succeeding generations. (Hear, hear). This "Children's Charter" was a most important one in the history of the country, and he was glad to see that the large counties and towns were taking the necessary steps to adequately carry out the work. Lady doctors and lady inspectors, as well as more men, had been appointed, and were doing splendid work; and the fact that a lady doctor could do as much work as a male "doctor and a-half" showed the progressive nature of the ladies. (A voice: "Question," and laughter). He was glad, in this connection, to say that there was a prospect of the feeding of school children being more extensively carried out. In all the schools in Lancashire, any rate, arrangements were being made, not only at food at a very cheap rate for the children, but to provide many of the schools, too, with the scholars. Inefficiently clad, and he was afraid the question of to face in the near future. It was impossible to attempt to instruct children unless they were in a proper condition to be educated. Another matter which would have to be faced was the condition of the home-life of many of the children; they should be taken from their present filthy and insanitary surroundings and placed under conditions of such a character as to enable them, when they grew up, to take a position in the social scale far higher than that occupied by their predecessors. (Hear, hear). For himself, he was pleased that his authority had not thought fit to give him the supervision of the children in Lancashire. This was work that ought to be done by specialists. He had quite sufficient to do in supervising the sanitary conditions of the schools and dealing with other matters of a purely sanitary character. It

was, however, satisfactory that those gentlemen who had been appointed to do this work acted in association with medical officers of health. He thought it would be a great mistake if they dissociated themselves from a Society such as theirs. (Hear, hear). Union was strength; and the only way to be strong was for the public health officers of the country to unite as far as possible. (Hear, hear). There had been a suggestion that county medical officers should form an association. For the same reason he thought that would be a great mistake. If the county medical officers desired to have a branch in connection with this Society, well and good; but he hoped there would be no separate association. (Hear, hear). They should also endeavour to enrol in the Society as many of the medical officers in the colonies as possible. This would add greatly to the importance and influence of the Society. (Hear, hear). He was pleased to see present so many representatives of kindred societies. He had always advocated that their Society should work with the sister profession—the veterinary profession; and he was sorry that there was no veterinary representative present that evening. In conclusion, Dr. Sergeant said he had felt great diffidence in accepting the presidency of the Society, but he did so in compliance with the request of the North-Western Branch; and if he failed to carry out the duties as satisfactorily as his predecessors, the blame must be attributed to the selection of the North-Western Branch. (Cheers and laughter).

Dr. BOND, Medical Officer of Health for Holborn, responded on behalf of the Metropolitan Branch, of which he was president, and which, he said, had now a membership of eighty. He stated that in the ten years before their Society was established, the London death-rate was about 25 per thousand; last year it was only 14.7 per thousand. That meant that every year they were saving about 50,000 lives—almost the population of a large city. (Cheers). Dr. Bond concluded by paying an eloquent tribute to the excellent and able work which Sir Shirley Murphy had done for preventive medicine in the metropolis.

Dr. HAMILTON responded on behalf of the North-Western Branch, seven representatives of which were present that evening, for the purpose, he said, of doing honour to their respected colleague, Dr. Sergeant. The members of the North-Western Branch were extremely proud of the honour the Society had conferred upon their branch in the election of Dr. Sergeant as president. Dr. Sergeant had done a vast amount of work on behalf of preventive medicine, and could be relied upon to bring wide scientific knowledge and ability to the deliberations of the Society. The fact had been mentioned with satisfaction that the Metropolitan Branch possessed eighty members. Well, the North-Western Branch had 130 members. (Cheers). Dr. Sergeant had stated, in the course of his observations, that a lady doctor could do half as much work again as a male doctor; but on that point he did not think their president's experience of the female sex was as large as that of some members of the Society. (Laughter). But

that was a detail into which he would not further enter. He again thanked them on behalf of the North-Western Branch for the cordiality with which the toast had been received.

Dr. NEECH, President of the Yorkshire Branch, spoke of the great assistance which the Society was to medical officers of health, and said that in Yorkshire they had, thanks to their very energetic secretary, a highly successful branch. Their meeting together tended to create a kindlier feeling and promote mutual sympathy; it also enabled them to exchange ideas and compare notes, and in that way they acquired information which was exceedingly useful to them in their work. (Hear, hear). The Society also enabled them to secure necessary reforms in regard to their own position. One of the most urgent of these reforms was the securing of fixity of tenure, and he was convinced that the Society would constitute a great lever in helping to secure that much-needed advantage. (Cheers).

Dr. C. R. MACDONALD replied briefly on behalf of the Scottish Branch. He had listened with great pleasure to the speech of Sir James Crichton-Browne, and wished that representatives of the local authorities in Scotland had been present to have heard Sir James's remarks. If they had been, he was sure the speech would have greatly advanced the cause of sanitation in Scotland, and also, he had no doubt, the salaries of the medical officers of health. (Cheers and laughter).

SIR SHIRLEY F. MURPHY then proposed the toast of "Kindred Societies." Referring to what had been said by previous speakers as to the creation of other societies, he said it would be a regrettable thing if there were established special societies within their own profession. Unless the work of public health were co-ordinated, its efficiency would be prejudiced and the country would be put to additional expense. (Hear, hear). The relations between their Society and the kindred societies had continued to improve, because they had recognised that their one ideal was the advancement of the public health. It was in that spirit that he asked them to drink the toast, with which he coupled the name of Mr. Searles-Wood, who represented the Royal Sanitary Institute.

Mr. SEARLES-WOOD, F.R.I.B.A., in responding, said he was glad to be able to announce that the Royal Sanitary Institute would be able to welcome the members of the Society of Medical Officers of Health in their new home at Christmas. (Hear, hear). It was situated just opposite the main entrance to the Victoria Station of the Brighton Railway, and they had accommodation there which they hoped would be sufficient for many years to come. The Society of Medical Officers of Health had done much excellent work, but he wished the members would add a touch of imagination to their other virtues. At present there was nothing attractive about sanitation to the artist. He suggested that as they were—to quote Sir James Crichton-Browne—interpreters of science, they should endeavour to interpret it in an artistic way. (Laughter). He was sure such

a course would have great influence on the public at large. ("Hear, hear" and laughter). He thanked them, on behalf of the kindred societies, for the felicitous manner in which they had received the toast.

The PRESIDENT, in submitting "Our Guests," expressed his pleasure at seeing so many visitors present. They were always glad to welcome representatives of allied professions, and were especially pleased that evening to have with them a representative in the person of Professor Delépine, of the work which was being so admirably carried out by bacteriologists. Professor Delépine's name was a household word in Lancashire, and he had been of the greatest assistance to the medical officers in the county. The toast also included the ladies, whose presence greatly enhanced the attractiveness and success of their annual dinners. (Cheers). In the unavoidable absence of Mr. W. Scott Barrett (Chairman of the Lancashire County Council), he would call upon Professor Delépine to respond to the toast.

PROFESSOR DELEPINE, in replying, said he had had the pleasure of listening some time ago to a great speech by Sir James Crichton-Browne, in which he demonstrated that their fear of over-feeding was grossly exaggerated, and that, after all, it was better for them to use the good things of this world well. ("Hear, hear," and laughter). He could assure his hearers that the guests had done their best to carry out the teachings of Sir James Crichton-Browne, and had spent a really enjoyable evening. ("Hear, hear," and laughter). He had always entertained a feeling of admiration for the ladies, and was very pleased to have the privilege of also thanking the Society on their behalf for the cordiality of their welcome.

An excellent programme of music was played during dinner by Farban's Band, and the speeches were interspersed with songs by Miss Katie Moss, and Mr. James Bovett; with humorous musical sketches by Mr. Archie Naish, and humorous lightning cartoon work by Mr. E. H. Mills, by permission of the Palace Theatre.

CORRESPONDENCE.

MICRO-ORGANISMS IN SEWER AIR.

To the Editor of PUBLIC HEALTH.

SIR,—It is satisfactory to note from the Supplement to the Thirty-sixth Annual Report of the Local Government Board, that the bacteriology of sewer air is again receiving close attention.

In January, 1902, I drew attention in an article in PUBLIC HEALTH on "Sewer Air and its Purification," considered chiefly from a bacteriological point of view, to the fact that Carnelly and Haldane had based their arguments on insufficient data. I recounted some experiments of my own carried out in the Bacteriological Laboratory, King's College, London, which undoubtedly showed that sewer air contained organisms derived from sewage and sewers, and I referred to Dr. David Arthur's graduation thesis on "The Bacteriology of Sewer Air."

Dr. F. W. Andrews in his able and interesting report

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COUNTY HEALTH ADMINISTRATION.*

BY EDWARD SERGEANT,
M.R.C.S., L.R.C.P., L.S.Sc.Medical Officer of Health to the Lancashire
County Council.

IN choosing me to fill the office of President to the Society of Medical Officers of Health, you have conferred an honour which I am bound to appreciate to the fullest extent, more especially as the possibility of occupying such a distinguished position never came within the purview of my ambition during the many years. I have been a humble labourer in the field of sanitation. I thank you most sincerely for the confidence you have reposed in me, and also for the compliment you have indirectly paid to the branch of the Society to which I belong. The responsibility—I will not say penalty—attached to my high office of having to deliver an inaugural address, is like the fly in the amber, and occasions a sense of alarm at the difficulties I have to encounter, and a feeling that

"So mighty and so many my defects,
As I had rather hide me from my greatness."

My brilliant predecessors have made it hard for me to follow in their footsteps; but I assure you, that during my occupation of the Presidential Chair, I will spare no effort to carry out the important duties of my office in accord with its best traditions.

I have experienced some hesitation in selecting a subject for my address, but when we consider the unusual amount of sanitary legislation now in progress, and the interest taken by all sorts and conditions of men in matters relating to the health of the people, there really ought to be no difficulty in finding a suitable theme. The position a medical officer holds in regard to the health administration of a large county, affords him ample scope for the discussion of matters of sanitary importance which may be worthy of your consideration, and not threadbare from much usage.

* Presidential Address delivered at the Meeting of the Society on November 13th, 1908.

EVOLUTION OF THE MEDICAL OFFICER
OF HEALTH.

In tracing the evolution of a medical officer of health, it is well to remember that he first came into being so far back as 1847, when by the Towns Improvement Clauses Act, Section XII., it was enacted that the commissioners of any local district may, "if they think fit," appoint a person of competent skill and experience who shall be styled "The Officer of Health," whose duty it shall be to ascertain the existence of diseases, "especially epidemics and contagious diseases, and to point out any nuisances or other local causes likely to cause and continue such diseases or otherwise injure the health of the inhabitants, and to point out the best means for checking or preventing the spread of such diseases. . . . and also the best means for the ventilation of churches, chapels, schools, registered lodging houses and other public buildings." It may be observed that the appointment was apparently of a tentative character, the expediency for which was open to some doubt. There was no intention that the health officer should necessarily belong to the medical profession, although there would be some of his duties which could be most satisfactorily discharged by any ordinary practitioner, but as a public prosecutor against unwholesome influences removable under the sanitary law, he would be required to exercise functions of a quasi-judicial character. Such an appointment could be most suitably filled by a person entirely engaged in the public health service either by a large sanitary authority or combination of authorities. In the Public Health Act of the following year, although the appointment still remained permissive, it was now provided that the officer should be a "legally qualified medical practitioner," while after a long period of probation a further phase was attained by the Public Health Act, 1872, which made it compulsory for each of the newly created urban and rural sanitary authorities to appoint an official known for the first time as the Medical Officer of Health.

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In framing the Local Government Act, 1888, by which the general plan of Local Government for England was so importantly augmented, Parliament again acted tentatively, in merely authorising county councils "if they see fit" to appoint a medical officer of health; and it is, I presume, partly in consequence of some of the smaller county councils not having taken advantage of this power of appointment, and partly due to the important sanitary duties imposed on them by the Education (Administrative Provisions) Act, 1907, that the Government in the Housing, Town Planning, &c., Bill now before Parliament, have introduced a clause making it incumbent on every county council to appoint a medical officer of health. Instead of simply requiring a medical officer of health to be a "qualified medical practitioner," Section 18 of the Local Government Act, 1888, provides, that in future every one appointed as medical officer of health, must possess an all-round legal qualification in medicine, surgery and midwifery, and the same section contains a far-reaching proviso that, after January 1st, 1892, no person shall be appointed medical officer of health to a county or sanitary district—urban or rural—having a population of 50,000 or upwards, unless he holds in addition a diploma in sanitary science, public health or state medicine, or has served as medical officer of health under certain specified conditions previous to the passing of the Act.

COUNTY ADMINISTRATION.

The power given by the Local Government Act, Sec. 17 (2) to the county council for rendering the services of their medical officer of health available in county districts, indicated apparently a desire on the part of legislature to enlarge the area for direct administrative control, and possibly secure greater efficiency with, at the same time, more economy. With one exception, Worcestershire,* this provision in the Act did not meet with the approval of district councils, who, as a rule, prefer to control their own officials, and county councils were not able or desirous of offering them any inducement to give up their freedom of action. The proposal for grouping and consolidating districts in a large county for sanitary purposes, even if advisable, would be extremely difficult, and would be met with great opposition from district representatives and from those now holding office, unless it was at the same time accompanied by proper compensation.

* Essex, Gloucestershire and Warwickshire are also exceptions but in these counties the medical officers of health, when appointed, held medical officerships and were allowed to continue them. In Hertfordshire, such a combination was not allowed by the Local Government Board in 1901, although from 1892-1900 in the case of Dr. J. A. Turner, an arrangement between the County Council and District Authority was allowed.

I believe it is far better for district authorities, in combination if possible, to be entirely responsible for their own sanitary government, with the assistance and advice of the county medical officer available when required. The latter, as an official of the county and independent of local considerations will, in my opinion, be more competent to carry out impartially his supervisory functions, and tender advice to the county council as to any shortcomings in their administrative area. The view of the present Government as to the utility of the scheme originally foreshadowed, is shown by the introduction of a clause in the Housing, Town Planning, etc., Bill, which provides for the withdrawal of this power on the part of the county and district councils for arranging with respect to the joint services of a medical officer of health.

The council of each county have an important obligation imposed on them to pay out of the Exchequer Contribution Account to every local authority one-half the salary of their medical officer of health, providing the appointment, salary and tenure of office "are in accordance with the Public Health Act, 1875, or any Act repealed by that Act." But it is also provided that no payment shall be made "if the Local Government Board certify to the council that such officer has failed to send to the Local Government Board such reports and returns as are for the time being required by the regulations respecting the duties of such officer." You will observe that county councils are merely required under certain specified conditions to make contributions to salaries, but they have no authority whatever in the making of the appointments or providing for the tenure of office, nor can they extend support to an official who may happen to be penalised for excess of zeal displayed in the carrying out of his public duties. Even the Local Government Board seem to be powerless when, as occasionally happens, district councils refuse to re-elect a medical officer of health at the conclusion of his period of office, although he may have conducted himself *sans peur et sans reproche*. Cases of great hardship might have been prevented if the Board had possessed the power of intervention, or if the recommendation of the Royal Sanitary Commission, made so far back as 1869, had become law, to the effect that a medical officer of health "should not be removable from office by any local authority except with the sanction of the central authority." The smaller, and a few of the whole-time appointments, are limited to one year, but they occasionally extend over two, three, or five years. Sir Walter Foster, Parliamentary Secretary to the Local Govern-

ment Board, in 1895, stated that "the Board had arrived at a rather important decision, viz., that we consider these appointments for short periods and precarious tenure injurious to the public health. . . . Men holding appointments for very limited periods cannot be expected to discharge their duties in that fearless and thorough manner which those duties require for the safety of the public, and we are anxious to encourage local authorities to give up the system of short appointments." The Board, about that time I believe, intimated to local authorities that under certain conditions appointments might, with advantage, be made for longer periods, and, if possible, permanent, i.e., during good behaviour; but judging by the districts of the county with which I have the honour of being connected, their advice did not receive the attention it deserved.

Although the question of salary is not one often discussed at our meetings, it has some bearing on the amount of work expected to be carried out by a medical officer of health, and indicates the importance of that work in the eyes of the authority which he serves. For some years, I am happy to say, the Local Government Board have tried to influence local authorities, especially the larger ones, in the direction of paying adequate salaries; but in many of the smaller sanitary districts not more than £20 to £30 per annum is still considered sufficient remuneration for the carrying out by the medical officer of health of his ever-increasing duties. Such salaries are too paltry even in the smallest districts for the conscientious performance of high-class professional services relating to sanitation, preparation of statistics, and other matters which have to be reported on periodically, and form annually the subject of an elaborate report.

A district medical officer of health has an important duty to observe in relation to county councils on which is based much of the county sanitary work; under Sec. 19 of the Local Government Act, it is necessary for him to supply the county council with a copy of every periodical report, including, of course, his annual report, prepared in conformity with the regulations of the Local Government Board; and "if a medical officer of health fails to send such copy, the county council may refuse to pay any contribution, which otherwise the council would, in pursuance of the Act, pay towards the salary of such medical officer." In addition, the regulations of the Board in 1891, respecting the duties of an urban or rural medical officer of health, require him to transmit to the county

council, a copy of any report he may make to the Local Government Board on any outbreak of infectious disease, or of any matter, such as school closure, which may form the subject of a special report. On the county medical officer devolves the duty of collating these reports for the information of his council, and if it appears from any report that the Public Health Act, 1875, has not been properly put in force in any district, or that any matter affecting the public health of a district requires to be remedied, the council may cause a representation to be made to the Local Government Board. This would probably be made under the Public Health Act, 1875, Sec. 299, and the Local Government Board, if satisfied after due inquiry of the alleged default, may make an order on the local authority for the performance of their duty, or appoint a person to perform the duty and recover the expenses from the local authority. Similar powers can now be exercised by the county council under the Local Government Act, 1894, Sec. 16, in case of default in sanitary administration by a rural district council; the parish council may complain to the county council, and, if after inquiry the county council are satisfied that there has been a failure as regards the subject-matter of the complaint, they may resolve that the duties of the district council for this purpose shall be transferred to them. On no occasion has the Lancashire County Council made a statutory complaint to the Local Government Board, under Section 299 already mentioned, respecting any district authority, as, I am glad to say, it has been found sufficient and more expeditious to communicate directly with the districts in default. I may also state that it is only on very rare occasions that parish councils appeal to the county authority in regard to sanitary neglect in rural districts.

The county council, by becoming possessed of the reports periodically issued by district medical officers of health, are enabled to compile valuable vital statistics, and obtain information concerning sanitary matters which, for comparative purposes, are much appreciated. The annual reports issued by medical officers of health are prepared with greater care and uniformity than formerly, when they merely attained the distinction of being pigeon-holed in the district offices. Useful information is now given by the medical officer of health, in accordance with the regulations of the Local Government Board, as to the action his authority has taken, or been advised to take, for preventing the spread of disease, and with respect to the sanitary supervision over the places and houses that

the local authority have to regulate, together with the nature and results of any proceedings which may have been necessitated. The report is also required to contain a record of the action taken in regard to offensive trades, to dairies, cowsheds, and milkshops, and to factories and workshops. Other information regarding water supply, scavenging, sanitary supervision of elementary schools, and any matters of sanitary interest are, as a rule, referred to in the report, and subjected to criticism in the annual digest of the county medical officer of health. In districts where sanitary matters receive insufficient attention, it is accepted as the duty of the supervisory authority—although not specified by Act of Parliament—to stimulate and encourage the lagging footsteps of local bodies, and it is interesting to observe how much a little tactful advice will accomplish. Local medical officers of health have invariably given me the fullest information on any subject appertaining to their districts, and to their credit, I may mention that monthly returns are voluntarily supplied to the county with reference to deaths and infectious disease; and, since the passing of the Midwives' Act, particulars respecting cases of puerperal fever are reported to me immediately after notification.

It was intended, as doubtless you are aware, when the Local Government Act was before Parliament, that county councils should be given direct controlling power over sanitary matters in the districts within their administrative areas, either on local complaint or on their own initiative; and later in the Session of 1889, Mr. Ritchie introduced a Provisional Order Bill, which contained proposals for transferring to county councils a variety of central powers, which, if carried out, would practically have meant the substitution of the county council for the Local Government Board as authority of control, although it was not proposed to transfer, as was intended by decentralising schedule of 1888, the important powers given to the Local Government Board by Section 299 of the Public Health Act. District councils and non-county boroughs throughout the country strongly resented the proposal that they should be made subject, as regards their sanitary administration to the county authorities, and, owing to this opposition, Mr. Ritchie's Bill was not proceeded with. As I have already mentioned, district councils in Lancashire have, with few exceptions, shown an earnest desire to carry out their public duties,

and judicious advice has been well received; but there is still much to be expected from the "coerciveness of knowledge and public conscience.*"

POLLUTION OF RIVERS.

Another work given to county councils on their formation relates to the pollution of rivers, and no one will deny that it has been carried out conscientiously and proved of immense sanitary value. By Section 14 of the Local Government Act, a county council is authorised to enforce the provisions of the Rivers Pollution Prevention Act in regard to streams which belong to the county or pass through, or by any part of its area "as if they were a sanitary authority within the meaning of that Act." I may observe that for a period of twelve years, no serious action was taken by sanitary authorities against polluters, and the Act passed in 1876, remained practically inoperative, and was spoken of as "utterly unworkable and useless," an opinion based on the experience of a few public authorities who had initiated proceedings under the Act in a faint-hearted and perfunctory manner. When county councils and the more powerful joint committees, created under Section 14, Sub-section 3 of the Local Government Act commenced their work, it was recognised that sanitary authorities would have to deal effectually with their sewage, and that polluting trade effluents would not be allowed to enter streams as heretofore. At the commencement of the new régime, manufacturers were soon up in arms, and even public bodies refrained from taking action until a few successful prosecutions showed that no one, however powerful, could escape—in Lancashire at any rate—from the operation of the Act. The joint committees already referred to have supervision of very wide areas, and the constituent authorities comprise administrative counties and county boroughs. I have knowledge of the three watershed committees constituted, viz., the Mersey and Irwell Joint, the Ribble Joint, and the West Riding of Yorkshire Rivers Board. The first two were created in 1891, after Local Government Board inquiries, and the latter came into existence in 1893. These committees, composed of members representative of the whole area under their jurisdiction, carry out their functions, I believe,

* English Sanitary Institutions, Sir John Simon.

more economically and efficiently in their joint capacity than as separate authorities, and it is difficult to explain why so few combinations of this kind have been formed in the large manufacturing centres of the country.* It should be thoroughly understood that these joint committees were only given the powers already possessed by urban and rural sanitary authorities, and such powers are exercisable concurrently without any abolition or curtailment of local control. But experience shows that when joint committees commenced their operations, they so completely carried out their duties, that sanitary authorities ceased to act. The Mersey and Irwell Committee represents a powerful combination possessed of ample means for enforcing authoritatively due observance of the law relating to pollution. It comprises portions of three administrative counties of Lancashire, Cheshire and Derbyshire, the important City of Manchester, and the county boroughs of Salford, Oldham, Bolton, Rochdale, Bury and Stockport. The following is a summary of the area, population and rateable value of this watershed as recently estimated:—

	Acreage at Formation.	Estimated Population.	Rateable Value. £
Lancashire	262,718	846,606	3,778,549
County Boroughs ...	32,656	1,347,420	7,176,427
Cheshire	250,348	276,073	1,495,924
Stockport (C.B.) ...	2,200	102,340	430,051
Derbyshire	20,781	53,371	285,044
	<u>568,703</u>	<u>2,625,810</u>	<u>13,165,995</u>

The joint committee of the Ribble watershed is composed of representatives of the administrative county of Lancashire, and the county boroughs of Blackburn, Burnley, Preston and Wigan; the drainage area, comprising 368,640 acres, is under their jurisdiction, with a population estimated at the last census at 1,122,864, and a rateable value in 1905, of £4,168,220. The watershed under the supervision of the West Riding of Yorkshire Rivers Board is a very extensive one, embracing the administrative county of the West Riding, the cities of Leeds, Sheffield and Bradford, and the county boroughs of Halifax, Huddersfield and Rotherham; altogether an area of 1,773,366 acres, with a population estimated at 3,004,662, and a rateable value of £14,549,122.

When these committees came into being,

* I find that the Royal Commission on Sewage Disposal (Third Report, 1903), recommend that River Boards should be formed for other parts of the country, similar to the three which exist in Lancashire and Yorkshire.

many of the large towns were accustomed to treat their sewage, but only exceptionally was the effluent sufficiently purified to allow of its entrance to a river without causing serious pollution. Of the forty-one towns in the Mersey and Irwell watershed, eighteen were entirely without any means of dealing with sewage, and their systems of sewerage were more or less imperfect. Urban authorities in a few instances treated their sewage, but it was stated at the Local Government Board inquiries, *re* the formation of joint committees in Lancashire, that even where works existed they were only used on "show" occasions, or during "certain times of the day," and the storm-overflows at the works were so arranged as to allow large volumes of sewage to pass continuously into the rivers untreated. When a flood occurred, offensive deposits were washed from the sewers or from the bed of the stream on which it had accumulated, and the various impurities, both in suspension and solution, were so concentrated as to poison or suffocate fish wholesale. The Ribble, which at one time had great repute for its salmon, and is, I believe, once more regaining it, was occasionally affected to a serious extent, and I have myself seen tons of fish destroyed in this way floating down the river.* The late Frank Buckland observed that a fish poisoned by pollution, as a rule died "with the gills and mouth widely extended as if gasping for breath." Damage due to sewage deposit was also done to the spawning beds, while the destruction of weeds and insect life forming the food of fish further aggravated the evil.

The principal sources of river pollution by manufacturing refuse within the Mersey and Ribble basins are derived from dye, print, and bleach-works, chemical works, tanneries, paper making, woollen works and silk works. These trade pollutions are amenable to chemical and mechanical remedies, which may be applied without interfering with the manufacturing interests, and as "necessity is the mother of invention" certain processes are now available for dealing profitably with many of the by-products. As a few instances, I may mention the employment of the "Magma" process for recovering crude oil from the soapsuds used in dyeing operations and wool washing. In the indigo dyeing trade the spent vat liquors and wash waters,

* The rivers Eden, Lune and Dee, on the west coast, have also been seriously affected by sewage deposit, (See Report of Royal Commission on Sewage Disposal, Appendix VI.)

after settlement, give a sludge containing so much indigo that it can be profitably re-used. In the paper trade, the strong alkali liquors obtained by boiling esparto grass with alkali, and which at one time were a source of gross pollution, are now evaporated, burnt, and the soda present in the resultant ash practically repays the cost of treatment. The waste waters from the paper machines also give sludge which is of considerable value. Mr. Halliwell, chief inspector of the Ribble Watershed Committee, informs me that a paper manufacturer, against whom an order was obtained for turning the sludge from the settling tanks into the river, has found his sludge to be of such value for paper making, that he is able by its use to effect a saving in raw material amounting to over £1,000 per annum. In the manufacture of soap, the spent lees are concentrated and distilled, and the glycerine, which at one time was turned into the river, is recovered; and, as a further example of saving, may be mentioned the recovery and conversion into coke of the sludge deposited in coal washing, which formerly was passed into the streams and formed a serious pollution.

One of my first duties as county medical officer required me to make an inspection of the rivers of Lancashire in regard to their state of pollution, and I had occasion to point out that many of them were more or less silted up by solid matter in the form of ashes from manufactories, household refuse (including the contents of ashpits), etc. Foul emanations were given off during the process of decomposition, which proved distinctly offensive and possibly injurious to the health of persons living in the vicinity. This form of solid pollution, I am glad to say, received immediate attention on the formation of the joint committees, and only a very short time elapsed before the nuisance ceased, although the injurious effects of the refuse deposited on the beds of the rivers may still be seen. The methods adopted by towns and urban districts in dealing with their sewage also soon came under the notice of the joint committees, and owing to the firm pressure applied, there is not one authority within their jurisdiction now without effective means of treatment. Careful supervision is exercised over the various sewage works in operation, and samples are taken periodically to see that the sewage continues to receive reasonable and proper purification. The same may be said

of the trade effluents which are generally dealt with on approved methods, and I believe without injury to the commercial interests involved.* The vast amount of work carried out by the joint committees and by many of the county councils, has been enormously expensive, but without doubt it has proved entirely beneficial, and of immense sanitary value, and those who have in any way rendered assistance deserve the greatest credit.

POLLUTION OF ESTUARIAL AND TIDAL WATERS.

Although much has been done to improve the condition of our rivers, there still remains to be dealt with the tidal waters (estuarial and other), and foreshores of a large portion of Great Britain, which receive serious pollution from the improper discharge of untreated sewage. For some years past shell fish (oysters, cockles and mussels) gathered from sources exposed to sewage contamination have been recognised as the cause of numerous well-known outbreaks of enteric fever, and shell fish, however slightly contaminated, more especially when eaten raw, cannot be looked upon as free from danger. The extent of the danger is great as regards Lancashire, for very few, if any, of the mussel or cockle beds can be said to be outside the "sewage zone" or uninfluenced by the polluting estuarial waters. Bacteriological investigations by Professor Herdman have shown the presence of the *B. coli* in practically all the mussels taken from the Lancashire coast; the sewage micro-organisms not being so frequently found in cockles, as apparently they have the power of cleaning themselves more readily than mussels (Klein). As the *B. coli* is not found in unpolluted salt water fish, its presence must be regarded with suspicion, and as evidence that the shell fish has lived in the sea water contaminated with sewage. It always indicates "the possibility that the shell fish in which it is found may, under certain circumstances, come to harbour microbes of a nature strictly pathogenic, such as the typhoid bacillus, but when the number of *B. coli* in a mussel is few, then this possibility is remote.†" Only a few instances are recorded of the *B. typhosus* having been isolated from shell fish, but there is reason to

*Dr. Thresh in his County Annual Report for 1907, says that "the gross pollution of the Essex rivers, which was not uncommon some ten years ago, is now a thing of the past. All the towns of any size have provided sewage works, and the effluent now discharged, though not always what it might be, is very different to crude sewage."

† Report (1906) in connection with the Lancashire and Western Sea Fisheries, by Professor Herdman, assisted by Mr. James Johnstone.

believe that it is not infrequently present. The investigations of Sir Rubert Boyce and Professor Herdman also show the inimical effect of sea-water on the growth of the typhoid bacillus*; it is also interesting to observe that the organism does not increase in the body or in the tissues of the oyster, and that it perishes in the intestine. Its presence indicates recent and therefore dangerous pollution if accompanied by large numbers of *B. coli*. The vitality of the typhoid bacillus in sea water and in water of different degrees of salinity has an important bearing upon the question of risks of specific pollution†, and in respect of oysters, Dr. Klein believes "that there is no such immediate disinfectant action possessed by sea-water as was formerly assumed, and that, therefore, persons who place oysters near to sewage outfalls in this belief, have no sufficient justification." He is of opinion, however, that in sea-water there is not much tendency to multiplication on the part of the typhoid bacillus, and the vitality of this organism is not indefinitely maintained there.

From another point of view the discharge of crude sewage into the open sea at low water mark, or into an estuary is important, especially if the tidal currents are not sufficiently strong to remove or dissipate the polluting matters without fear of their return, or of their deposition in dangerous proximity to the shore. In the case of an estuary the sewage may be carried to sea very slowly, and supposing it to be discharged on the ebb tide, it may be carried only a short distance before it is driven back by the flood, and so oscillate backwards and forwards, causing possibly a nuisance dangerous to health. As such conditions affect some of our chief watering-places they cannot be regarded with equanimity. I am, therefore, pleased to observe that this question has had the close consideration of the Royal Commission on Sewage Disposal, and in their fifth report they express the opinion "that unless the tidal currents are exceptionally strong and the volume of tidal water available for diluting the sewage is large in a given locality, the heavy solids of sewage and trade wastes should not be allowed to be discharged into tidal waters," and they also suggest that

* In experimental oysters inoculated with typhoid, the organism could be recovered from the body of the oyster up to the tenth day.

† Dr. Bulstrode on oyster culture in relation to disease (Local Government Board twenty-fourth Annual Report.)

no outfall should be permitted which discharges crude sewage at such a point that at low water the sewage flows either on to a stripped foreshore or into slack water.

ISOLATION HOSPITALS ACT.

Soon after the County Sanitary Administration came into force, it was found that local authorities were inadequately supplied in respect of hospital accommodation for isolating cases of infectious disease. In 1892, the County Councils' Association promoted a Bill to make provisions for such hospitals. In the following year the Bill was amended, and under the able guidance of Lord Thring, it became law as the Isolation Hospitals Act, 1893, and county councils were empowered to establish in any of their districts an isolation hospital for the reception of patients suffering from infectious disease. The initiative action can be taken by the county council in consequence of an application made to them by any local authority, urban or rural, or twenty-five or more ratepayers, or as a result of an inquiry made by the County Medical Officer of Health at their request. On the county council being satisfied as to the necessity of an isolation hospital, they may constitute a "hospital district," consisting of one or more local areas, and also a committee for the management of the hospital, composed of representatives of the sanitary authority or combined authorities, with the addition of members of the county council if thought fit. Power is given to the county council by Section 21, to contribute a capital or annual sum towards the structural and establishment expenses of an isolation hospital so provided, or to either class of such expenses, and by an amending Act passed in 1901, the county council may extend their contribution to any hospital established by a local authority under Section 131 of the Public Health Act, 1875. The question of contribution has been much discussed by county councils, and the methods adopted are by no means uniform. In Cheshire, the council contribute to isolation hospitals, for which loans have been sanctioned, one-third the cost of site, buildings, and maintenance; to some districts retaining beds in hospitals, one-third of the annual cost; and to old hospitals, one-third annual cost of maintenance. The Derbyshire County Council pay one-fifth cost of construction, but this must not exceed £40 per bed; in addition, a grant of £10 per bed is made annually towards

the establishment expenses. In Essex, £5 per bed is paid to hospitals erected out of loans, and this contribution in 1907, amounted to about £1,500. In Northamptonshire, the council pay one-half of the establishment expenses of isolation hospitals, equivalent to about £475 per annum. In Lancashire, the difficulty in the way of making a fair and equitable contribution towards the isolation hospitals erected under the Public Health Act, 1875, has decided the council to make no contribution, and as far as I am aware, the local committees are quite satisfied to carry out unaided their duties in regard to hospital provision. Other counties, for instance, Durham, Northumberland, Salop, West Riding of Yorkshire, Worcestershire, &c., have, I believe, adopted a similar line of action.

By the application of judicious pressure, county councils have been enabled to secure the hospital accommodation which was wanting previous to the passing of the Isolation Hospitals Act, and in regard to the County in which I serve, the majority of districts are now provided either directly with hospital accommodation, or have acquired the privilege of sending infected patients into hospitals provided by neighbouring authorities. Large combined districts have also been formed for the isolation of small-pox, and these have effected a great saving, with increased efficiency, as compared with the efforts of individual authorities. In Lancashire, the proportion of cases removed from hospital-provided districts varies considerably according to the disease and character of accommodation. The following table shows the cases of infectious disease, other than small-pox, treated in hospital as compared with home treatment during the five years, 1903-1907.

Disease.	Where Treated.	Cases.	Deaths.	Mortality Per Cent.	Percentage of Cases Isolated in Hospitals.
Scarlet Fever	Hospital	11,820	328	2.7	29.8
	Home	27,739	981	3.5	
Diphtheria	Hospital	1,398	161	11.5	16.4
	Home	7,126	1,346	18.8	
Enteric Fever.	Hospital	1,860	355	19.0	30.2
	Home	4,296	826	19.2	

Although I do not propose to enter into the controversy as to the utility of isolating scarlet

fever, which was started by Dr. Wilson, of Lanarkshire, in 1897, and has attracted the attention of several well-known members of our Society, I must say that as far as my experience goes, a scarlet fever patient has a better chance of recovery in a properly constituted hospital, than in the ordinary cottage home, and I know how much removal is appreciated by the public at large, whether engaged in business or otherwise, and I may say also by the patients themselves. I quite agree that the hospital isolation of scarlet fever, has not quite answered expectations in regard to the curtailment of disease, but at the same time, no efficient sanitary authority can do without it. The non-removal policy, I always look upon as possessed of many attractions for parsimonious authorities, but to my mind, it seems very selfish to endanger the health of neighbouring districts, while engaged in the hopeless attempt to procure isolation in the ordinary dwellings of the working class.

PROVISION OF SANATORIA FOR THE TREATMENT OF CONSUMPTIVES.

Under the Isolation Hospitals Act, as already mentioned, a county council may constitute a committee to provide hospital accommodation for patients suffering from infectious diseases, i.e., from those specified in the Infectious Diseases (Notification) Act, 1889, while under Section 26 of the Isolation Hospitals Act, 1893, the term "infectious diseases" may be applied to any other disease such as pulmonary tuberculosis, by order of the County Council with the consent of the Local Government Board. In such an order the county council may form a hospital committee or committees, under the Isolation Hospitals Act, for the specific purpose of providing hospital accommodation for consumptives, and may contribute towards the cost or maintenance of such hospital. The hospital committee have power, under Section 3 of the Isolation Hospitals Act, 1901, to enter into agreement with local authorities for the use of the whole or part of a hospital for the reception of their patients, and defray the expenses of such accommodation. There is therefore ample power on the part of county councils to erect or to purchase sanatoria, to contribute to the maintenance of patients in such establishments, and within certain limits to compulsorily combine sanitary authorities for the purpose of providing

sanatoria. It appears that, so far, Devonshire and Cheshire are the only counties which have added pulmonary tuberculosis to the list of "infectious diseases," but no special accommodation has yet been provided out of the county funds; in the counties of Durham, Westmoreland and Worcester some provision has been made by guardians, district councils, etc., by adapting pre-existing buildings for treating consumptives, and the boards of guardians of the city of Liverpool have combined for the erection of a permanent sanatorium at Heswell on the banks of the river Dee. Dr. Bulstrode reports favourably to the Local Government Board as to the value of sanatorium treatment in pulmonary tuberculosis.* As far as the "immediate result to the individual" is concerned, he believes the best results are obtained when the patients are admitted to treatment in the earlier stages of their malady, but as to "after results," that is the remoter benefit referable to sanatorium treatment, he hesitates to give an opinion.

HOUSING OF THE WORKING CLASSES.

The problem relating to the suitable housing of the working classes is one of great difficulty in many towns with congested populations, and to a less degree in the small urban districts and rural areas. Since Torrens's Act, in 1868, and Cross's Acts in 1875 and 1879, for providing better dwellings for artisans and labourers became law, the desire on the part of legislature to improve the housing of the industrial portion of the community has resulted in several Acts of Parliament—commencing with the Housing of the Working Classes Act, 1885—being passed with this object in view. At the present time the increasing facilities for rapid locomotion has created a strong disposition on the part of the inhabitants of towns to reside in the rural districts, and in order to make provision for this overflow the President of the Local Government Board, in his Housing, Town Planning, etc., Bill now before Parliament, proposes to give assistance to adequate schemes devised "with the general object of securing proper sanitary conditions, amenity and convenience in connection with the laying out and use of the land." In the promotion of the new schemes, efficient control will be substituted for chance which has

played such an important part in the town formation of the past, and local authorities will be able to promote schemes, not only in their own areas, but in the areas of neighbouring authorities; and also associate themselves with the authority responsible for the local administration of public health, etc. It seems to me reasonable to suggest that in any town-planning scheme within an administrative county area, the county council should be included, and they should play an important part in determining how the land should be laid out, the width and direction of the main arteries of traffic, the sewerage and sewage disposal, etc. Unless these matters are satisfactory to the county authority, difficulties will arise that would be better avoided at the initial stage of the scheme. As far as Lancashire is concerned, except in certain boroughs and large urban districts such as Darwen (B), Eccles (B), Ormskirk, Prescott, Stretford, etc., very inadequate action has taken place under the acts relating to the housing of the working classes, and in respect of rural districts practically nothing has been done in this direction, and no application has been received by the county council under Section 2 of the Housing of the Working Classes Act, 1900, to adopt Part III. of the principal Act.* The latter Act was primarily intended to cope with the evils in towns, and only incidentally intended to apply to rural districts. Much overcrowding is, I believe, caused by a lack of house accommodation in villages, and houses are in consequence allowed to be occupied, although unfit for habitation. The water supply is frequently polluted and the drainage defective, and I quite agree with Mr. Wilson Fox† that in rural districts cottages are sometimes empty on account of there being no water within a reasonable distance; whilst there are many villages where the water supply is not only deficient in quantity, but bad in quality, thereby causing unhealthy conditions and hardship to the occupier. By Clause 2 of the Bill promoted by Mr. Burns, power is given to the Local Government Board to declare that a local authority has failed to exercise their powers under Part 3 of the principal Act, and the Board can "make an order directing that authority, or if the Board think fit, in any case where the authority in default is the council of a county

* The Housing of the Working Classes Act, 1890.

† Report of Select Committee on Housing of the Working Classes Acts Amendment Bill, 1906.

Local Government Board Report, 1905-6, Dr. Bulstrode on Sanatoria for Consumptives &c.

district, the county council," to carry out the work required to be done. By further complicated procedure, to be initiated by the Local Government Board, it is proposed to make sure of the execution of the Housing Acts by the authorities concerned; but I do not think such power will ever be put in force, or would prove successful in operation. In housing legislation, procedure should be simplified, and the county council might with confidence be given power to carry out any new duties without the sword of Damocles in the form of a Local Government Board mandamus being constantly held over them.

MIDWIVES ACT, 1902.

Probably the most important sanitary duty that county councils have to perform is that of administering the Midwives Act, 1902. Its importance cannot be over-estimated, for it concerns the lives and health of mothers and new-born infants, and affects most intimately the former, especially if in their parturient condition, they should be in want of the means for securing the professional care and attention so much needed. From the Registrar-General's report it appears that in 1906 there were recorded in England and Wales 1,640 deaths of women from puerperal septic diseases, and 2,117 from other diseases of pregnancy or of childbirth, together amounting to 3,757, and equivalent to a rate of 4.02 per 1,000 births. In the ten years immediately preceding, the average proportion had been 4.48 per 1,000. To this large mortality from child-bed illness, half of which at least is capable of prevention, there must be added, according to Sir James W. Byers, of Belfast, "the further incalculable loss from secondary gynaecological disease, and sterility entailed by slighter and not immediately fatal cases of infection." In discussing the amount of morbidity, Sir Wm. J. Sinclair, in a valuable paper read before the North-Western Branch of the Society, stated that for every fatal case of puerperal fever there are at least five, six, or seven cases of child-bed morbidity which cause chronic ailments and produce in some measure continuous suffering and prolonged or permanent disablement. By the adoption of strict hygienic measures, it has been amply shown by him that puerperal infection may be considerably reduced. Among many instances, I may mention that in 1880, one-half of the

women confined within the Rotunda Hospital (Dublin) suffered from puerperal fever; while in 1905 of 1,887 cases the percentage of morbidity was only 8.42, without a single death.* Dr. Boxall reported in 1905 that 8,373 cases had been attended in the General Lying-in Hospital (London), "and not one death from sepsis originated in the hospital in the course of sixteen years." It would appear that in many of the continental towns the results of home treatment, judged by the amount of mortality and morbidity from child-bed diseases, are nearly as successful as in the lying-in hospitals; but it must be remembered that the midwives are better trained than in this country, and under more rigid supervision. In England and Wales during 1906, the mortality at child-birth from puerperal septic disease was equal to 1.7 per 1,000 births, indicating to my mind a proportion of deaths which might be much reduced by the strict enforcement of antisepsis and asepsis, and by less interference on the part of those in attendance with the course of natural labour. In Lancashire, 811 midwives attended last year 21,583, or practically half the county births, with the occurrence, so far as can be ascertained, of 25 puerperal fever deaths equal to 1.15 per 1,000 births; while as a result of 21,558 births attended by other than certified midwives, 42 women died from puerperal fever, equivalent to 1.94 per 1,000 births. These facts are difficult to explain, but I am inclined to believe that certified midwives, with all their faults, are not responsible for an undue share in the dissemination of puerperal infection. It is very difficult to obtain correct information on this subject, as notification with respect to puerperal fever is imperfectly carried out, and even death certificates are not always free from ambiguity. This uncertainty will continue until the Notification of Births Act, 1907, is generally adopted, and exact knowledge of births is rendered available for local supervising authorities. By Section 2 the council of a county may adopt the Act either for the whole county or for any county district, and pay the expenses incident to its enforcement, but as far as I am aware the only county† that has taken practical action in

* Report by Dr. Tweedy, Master of the Rotunda Hospital for 1905.

† The Leicestershire County Council have recently applied to the Local Government Board for consent to adopt the Act for the whole county, but the Board have suggested that in the first instance the district councils should have an opportunity of adopting the Act.

this direction is Durham, where health visitors have been recently appointed at the county expense to carry out their duties in three specially selected districts in which the infant mortality is unduly high.

Time at my disposal will not allow me to discuss the many interesting and important details respecting the administration of the Midwives Act. I may, however, express my opinion that it has initiated a most valuable work in this country, which month by month is attaining greater perfection. The rules of the Central Midwives Board have lately been subjected to most careful revision, and experience shows that they are being administered with great efficiency, and that a vast improvement has been effected in the character and methods of midwives generally. It is also pleasing to note from the reports that are periodically presented to local supervising authorities in various parts of the country, that even the illiterate midwives are being educated to perform more satisfactorily their duties. To fill the gaps that are constantly taking place in the ranks of the *bonâ fide* midwives, it is hoped that better trained women will be available, and perhaps some of the supervising authorities may find it necessary, in order to make provision for their possible needs in the near future, to offer suitable persons some inducement to take up this important work.

FOOD ADULTERATION.

The only other subject I have to refer to at any length is that of food adulteration. On the passing of the Local Government Act, Lancashire and other counties took over from the county magistrates the administration of the Sale of Food and Drugs Act, 1875, and continued the appointments of members of the police force, usually the superintendents, as inspectors under the Act, with the subsequent addition in some instances of special inspectors. Certain county councils appear to have made arrangements with the sanitary inspectors of district councils to purchase samples, but in 1902, on the question being raised, by way of surcharge on audit, as to whether a county council could employ officials not acting under their direction, some modification of the system took place. The number of samples purchased for analysis in the large counties, as shown in the following tabulated

statement,* varies considerably, and there is also great variation in the percentage of adulteration.

SAMPLES PURCHASED UNDER THE SALE OF FOOD AND DRUGS ACTS DURING THE FIVE YEARS, 1903-1907.

County.	Population Census, 1901.	No. of Samples Examined.	No. Adulterated†	Percentage of Adulteration†
Cheshire ...	488,115	5,189	176	3.3
Derbyshire ...	436,135	5,309	380	7.1
Durham ...	729,150	4,154	406	9.7
Essex ...	778,267	7,511	780	10.3
Kent ...	687,392	16,249	1,083	6.6
Lancashire ...	1,454,934	16,355	1,088	6.6
Middlesex ...	792,314	22,713	1,140	5.0
Staffordshire ...	858,601	11,497	608	5.2
Surrey ...	473,134	5,768	558	9.6
Worcestershire ...	333,696	6,208	207	3.3
Yorks, West Riding	1,249,685	13,331	476	3.5

† The word "adulterated" implies that the sample was not certified by the public analyst as genuine, and does not imply that any person was convicted of an offence.

It is impossible to explain the difference in the amount of county adulteration without knowing the particulars as to the mode of procedure in purchasing samples, and the character and number of the articles purchased in accordance with the Act, or as "test" samples, *i.e.*, without formalities. Of course, it is quite easy to understand that where vigorous action is taken in a district, there will be a tendency for adulteration to remain in abeyance; for example, I may mention that in 1904 it was not an uncommon practice for shops to be opened in the manufacturing districts of Lancashire by fraudulent traders, who posed as Irish egg and butter merchants, and advertised largely their butter at considerably less than market price. Test samples of the butter on being analysed were found to be margarine, and on the police becoming satisfied of the fraudulent nature of the business, they took the persons engaged in it into custody, with the result that three of them were found guilty at the Manchester Quarter Sessions of obtaining money under false pretences, and sentenced to twelve months' hard labour. As might be expected, these convictions induced the remaining members of the gang to seek districts more favourable for their nefarious operations. Another instance may be given of the stoppage of an extensive sale, in Lancashire, of pepper, adulterated with ground olive stones and bleached husks. The following are facts of this case:—November 24th,

* Local Government Board Annual Reports, 1903-1907.

1903, sample of pepper purchased Newhey (Co-operative Society), was certified to contain 8 per cent. of olive stones. January 6th, 1904, society summoned under Section 6, Sale of Food and Drugs Act. Case dismissed on production of warranty from Messrs. S. & J. R., Manchester, who had supplied a keg of pepper direct from the grinder, C. J. Therefore the pepper in question never came into the hands of Messrs. R. at all, although they received a guarantee from C. J. as to its purity. An information was therefore laid by Messrs. R. (on behalf of the County Authority) against C. J., under the Merchandise Marks Act, 1887, for having applied a false trade description to goods. On June 16th, 1904, C. J. was tried before the Liverpool City stipendary (Mr. Stewart), and sent to prison for three months without the option of a fine. Before the case was heard, Mr. Stewart granted a search-warrant upon the works of C. J., and eleven lorry loads of ground olive stones, bleached and unbleached pepper husks, and adulterated pepper, were removed from the premises by the police and afterwards destroyed. On leaving prison, C. J. gave up a very lucrative business and left the country.

I find on looking through the samples purchased in Lancashire since the passing of the Sale of Food and Drugs Acts that there has been a gradual decline in the total amount of adulteration, from 19.5 the average percentage from 1876-1881 to 6.6 from 1903-1907. The following table shows that during the last five years the adulteration of butter and miscellaneous articles has declined in Lancashire, but no practical improvement has taken place as regards milk.

PERCENTAGE OF OFFENCES.
LANCASHIRE ADMINISTRATIVE AREA.

Year.	Milk.	Butter.	Miscellaneous Articles.
1903	7.2	5.8	8.0
1904	7.2	7.3	7.2
1905	8.3	4.9	5.0
1906	9.6	2.1	3.9
1907	7.0	2.3	2.8

After the long experience in this country of the working of Acts passed with the object of preventing food adulteration, it is surely a reflection on the Government

that milk, the most important article of food so far as the infant is concerned, still continues to be subjected to such frequent adulteration. The reason to some extent may be due to the simplicity of this form of adulteration, and the attractive convenience of the "cow with the iron tail" proving too tempting for the dishonest milk dealer to resist. The standard set up by the Board of Agriculture under Section 4 of the Sale of Food and Drugs Act, 1899, is a good one in my opinion, but its value is largely neutralised, as it merely raises "a presumption until the contrary is proved" that the article is not genuine. I regret to say that it is becoming increasingly difficult to obtain convictions in any case of alleged milk adulteration, and occasionally cases are even dismissed by the magistrates, although there may be practically no evidence for the defence. In order to avoid these difficulties I quite agree with the idea that there should be a fixed universal standard of genuineness below which the sale of milk should be prohibited. A resolution in agreement with this view was passed by the Council of Municipal Corporations in July, 1907; and in the report of the Board of Agriculture and Fisheries, for the same year, I find it stated that "there is much to be said in favour of a universal standard, and if the prohibition against the sale of milk below the standard adopted applied to wholesale as well as retail transactions, it would certainly be convenient that the standard should be universal, so that farmers sending milk into different districts should know that the milk would be treated alike wherever it was sent." With respect to the prosecutions for the use of preservatives, the practice in the various courts differs considerably, and in order to produce uniformity of action, the Board of Agriculture should not further delay the making of regulations as to preservatives in accordance with the recommendations of the Departmental Committee. As far as milk is concerned, there ought to be no difficulty, for the committee recommended that the use of any preservative or colouring matter whatever in milk offered for sale in the United Kingdom be constituted an offence under the Sale of Food and Drugs Act.

By the enforcement of the Butter and Margarine Act, 1907, fraudulent blenders of butter will find it more difficult to continue their profitable system of adulteration, as now premises used for the blending or re-working

of butter have to be licensed and subject to inspection. Previous to the passing of this Act, there were certain large butter blenders making annually considerable sums of money, representing thousands of pounds, by the scientific sophistication of butter. Their mode of procedure was to mix with butter, say 20 per cent. of a neutral fat difficult for the analyst to identify called "lardine," and in some cases they used certain proportions of cocoa-nut oil and specially prepared animal fats, the object being to obtain a mixture of fats which would have approximately the same iodine number and refractive index as ordinary butter. An interesting prosecution for this form of adulteration, and one showing the difficulty, and expense of pursuing adulteration to its source, was successfully conducted by the Lancashire County Council in 1905, under the Merchandise Marks Act, the wrongdoers being followed from Radcliffe to their place of business in the City of London. On an information laid against Messrs. C. & Y. (the fraudulent firm) at the Clerkenwell Police Court, a search-warrant was granted, and on being executed a large quantity of goods were seized and found to be adulterated. After several days hearing, the stipendary in one case fined Messrs. C. & Y. £20 and £250 towards the costs of the County Council, and in another £5 and £52 10s. 0d. costs. Much of the trouble experienced in running to earth the chief offenders in this case will be in future avoided by the operation of the legislation already mentioned.

In my remarks, which I trust have not proved wearisome, I have endeavoured to explain the powers of county councils in regard to health administration, and to show that with increasing confidence fresh duties are being constantly added by legislature. Great attention is now being directed to new and vastly important duties provided by the Education (Administrative Provisions) Act, 1907, in respect of the medical inspection of the school children, and I regret that I cannot speak with any authority on this subject at the present time; but I fully believe that this new legislation will attain its aim in effecting an improvement in the health and physique of the present generation, and "as a natural corollary, the mental and moral improvement of coming generations."

THE DEVELOPMENT OF PUBLIC HEALTH WORK.*

By R. E. LAUDER, M.D., F.R.C.S.,
Medical Officer of Health, Borough and Port of Southampton.

I PROPOSE to-day to review briefly the history of the development of public health work, including therein its latest phase—the medical inspection of elementary school children.

The latter being a subject of paramount importance, and of such a complex nature, it behoves those responsible for its administration to consider it at every available opportunity.

By briefly reviewing the duties of the medical officer of health in the past with his duties to-day, we shall be in a position to appreciate the possible extensions of the future, and the way they are liable to be modified by recent legislation.

With the commencement of the reign of Queen Victoria might be said to have begun the dawn of public health work.

A Royal Commission was appointed in 1833 to examine into the treatment of children in factories, and the report of that Commission led to the passing of the Poor Law Amendment Act, and the creation of a Central Administrative Commission for the purposes of the Act. In 1838 the Poor Law Commission drew the attention of the Home Secretary to the large amount of preventable diseases existing, which they considered, caused pauperism.

In the following March, the House of Commons appointed a Select Committee "to inquire into the circumstances affecting the health of the inhabitants of large towns, with a view to improve sanitary arrangements for their benefit."

Three months later, this Committee reported:—

- (1). That there ought to be a General Buildings' Act.
- (2). That there ought to be a General Sewage Act.
- (3). That in every town of a certain population there ought to be a standing Board of Health, which should observe the health of the town, should move the local commissioners of sewers or other

*Read at Meeting of Southern Branch of the Society of Medical Officers of Health, September 24th, 1908.

authority in relation to nuisances, should suggest remedies, and should from time to time report to the Secretary of State or other central authority; and

- (4). That in every large town there ought to be an Inspector to enforce regulations for sanitary purposes.

The report also referred to burial grounds, water-supply, public open spaces, lodging-houses, baths, and clearing and improving sites, as matters of public interest needing consideration.

In 1845, the Government unsuccessfully introduced a very comprehensive Bill "for the improvement of the sewage and drainage of towns and populous districts, and for making provision for an ample supply of water, and for otherwise promoting the health and convenience of the inhabitants."

Independent of the Government, other influences were making for sanitary reform. Many of the large towns and populous districts proceeded to obtain Acts of Parliament giving them independent powers for improvement purposes.

In 1847, when much evidence had accumulated of the rapidly increasing desire of towns to obtain adequate powers of self-government for sanitary purposes, Parliament passed a series of Clauses Consolidation Acts applicable at option to the various sanitary and other purposes of town government. Such was the Act, 10th and 11th Vic., c. 34, commonly called the "Towns Improvement Clauses Act, 1847," which set forth in 216 sections the provisions usually contained in Acts for paving, draining, cleansing, lighting, and improving towns. In the same year (1847) there were also passed the "Markets & Fairs Clauses Act"; "Gas Works Clauses Act"; "Water Works Clauses Act"; "Cemeteries Clauses Act," and the "Towns Police Clauses Act."

Lord Morpeth's Bill "The Public Health Act, 1848," created a new executive department—a General Board of Health—which under the Act was to consist ordinarily of three members; one ex-officio, Her Majesty's First Commissioner of Works; and two (one paid, the other unpaid) appointed by Her Majesty.

Among the disadvantages which curtailed the usefulness of the Board were:—

Want of a responsible Minister.

Want of authority to appoint permanent skilled inspectors.

Want of a medical advisor—it had no medical man as one of its members or officers.

The legislation of 1848 closed a ten years' struggle which had been waged in the interests of public health, and marks the period when the foundations were laid on which the present superstructure rests.

The comprehensive views on sanitary matters, held at that time by the General Board of Health, are evidenced in the Instructional Minute which it issued in 1848, requiring the medical officer of health to make himself familiar with the natural and acquired features of the place to which he was appointed; with the levels, inclinations, soil, wells, and watersprings of the district; with its meteorological peculiarities; with the distribution of its buildings and open spaces, and of its burial grounds; with its drainage; with its industries; with the housing accommodation of the poorer classes and their opportunities for personal cleanliness; and with the regulations in force for slaughter-houses and lodging-houses, and for the removal of domestic refuse; to obtain information as to the prevalence of disease and the extent of its dependence upon preventable causes.

We cannot fail to acknowledge in that Minute of sixty years ago the rock-bed on which sanitary science has developed.

Notwithstanding the progressive character of sanitary science, the legislation of the succeeding half century continued mainly to advance on similar broad and general lines.

Bacteriology has certainly modified our views as to the importance of the part filth, overcrowding, insanitary dwellings, defective drainage and soil, play in the causation of infectious fevers, by demonstrating that specific micro-organisms are associated with such diseases. It has shown that they are mainly disseminated by contact with the infected person. The way in which apparently healthy people (so-called carrier cases) can spread infection, and the part played by certain animals and insects in causing disease have been amply demonstrated.

Our knowledge concerning tuberculosis has been rendered more comprehensive, and the wisdom of a thorough supervision of the meat and milk supply of the people firmly established. The recent epoch-making experiments of Calmette and Guérin have proved the intestinal origin of most cases of phthisis.

The annual records issued by the Registrar-General, showing a constant fall in the death-rate, form evidence to public bodies that the experience purchased by human suffering and loss of life dictated the various laws which make for public health; they also serve as proof to enforce the lesson that every method for extending the beneficial influence of preventive medicine should be brought into operation as a means of furthering the social and economic interests of the community.

The legislation, which had its origin in panic, and its object in relieving the suffering and abasement associated with widespread epidemic disease, has extended in recent years to embrace diseased conditions which have to be sought for in the individual.

The recognition of these diseased conditions ought to lead the way to the adoption of specially considered methods of treatment to relieve the morbid condition of mind or body—when present—or to prevent their occurrence in specially susceptible subjects, and so produce conditions under which development and growth may advance in a manner most beneficial to the individual, the community, and the State.

It is interesting to consider what possible expansions may result from the Education (Administrative Provisions) Act, 1907, which makes it the duty of the local Education Authority to provide for the medical inspection of elementary school children, and gives the power to make arrangements for attending to their health and physical condition, subject to the approval of the Board of Education.

A Memorandum issued by that Board in November, 1907, states that the effectiveness with which the medical inspection is carried out, will be considered in determining the efficiency of a school as a grant-aided school; it at the same time recommends that the work should be organised so as to admit readily of such expansion as may be indicated by carefully recorded observation.

In January of the present year the Board issued a Circular containing a schedule of medical inspection, which was to be regarded as a minimum.

This Memorandum and Circular clearly lay down, and, in the most concise and practical manner possible, point out how a local authority may obtain information of the physical and mental condition of each scholar attending the elementary schools.

It would not be reasonable to conclude that the enormous amount of work required by the Board of Education could be intended simply for statistical purposes. It is evident that the Board had good reasons for believing that the permissive portion of Section 13, Education (Administrative Provisions) Act, 1907 (*i.e.* that portion which gives the local education authority power to make arrangements for attending to the health and physical condition of elementary school children) should (in many cases) be compulsory, and that they were convinced that the statistical results of the compulsory portion would be sufficient to impress on most local authorities what was necessary. The object of this information is not simply to be used for adapting the different methods of school work to meet the needs of particular children, but as the initial step towards diminishing incapacity in the child, and developing to the utmost his usefulness in after life.

That finally, many, if not all, elementary school children will be medically treated, is made more manifestly the intention of the Board of Education by the Circular issued and dated 17th August, 1908. There it is stated that, although the Board are not at present in a position to make any definite or final pronouncement on any scheme for the amelioration and physical improvement of school children, it considers that, before direct treatment of ailments is undertaken by a local authority, full advantage should be taken of existing hospitals and dispensaries.

The Board does not suggest that these institutions should be used without adequate payment, including remuneration of the medical men associated with the work of such institutions.

One of the most serious duties of a Government is to exercise care and promote legislation for the health and happiness of the people.

The idea that human suffering and weakness is largely preventable, becomes daily more and more recognised by the public; and, at the same time, it realises its duty to control, guide, and assist the individual on humane, as well as economic, considerations.

The movement set on foot in the public

elementary school has for its object to reach each member of the community at an early period, and, by advice and assistance, relieve or remove immediate distress and suffering, prevent or modify errors and defects which would probably handicap the individual in the struggle for existence, and diminish his usefulness and value as an asset of the State, if they did not, as so frequently happens, leave him a burden on the community.

The difficulties of establishing an effective administrative scheme to carry out the compulsory work of the moment are considerable. The various circulars issued by the Board on the methods of procedure are clear and practical, but whatever ground-work is laid down now should be of such a character as to readily lend itself to carry out the particular or special medical treatment that may be indicated from time to time.

The Board of Education, while giving medical inspection to local education authorities, strongly urge the necessity of the work being carried out under the supervision of the medical officer of health.

Unification and supervision of the work with that of the public health service is strongly urged, and certainly seems indicated if the most effective results are to be obtained, and overlapping and waste avoided.

The duties of the medical officer of health continue to become more onerous; while increasing his responsibilities very considerably, they place within his reach a power which, if exercised judiciously, must add enormously to the usefulness of that part of the public service which tends for health.

The Act of 1907, providing for the inspection of children, broadens the work of public health in a manner unprecedented in the legislation of the past sixty years. Most Acts provided for dealing with particular areas and the unhealthy condition of dwellings, individuals, etc., reported to, or coming to the knowledge of a sanitary authority, but the Act of 1907 provides for a general and systematic inspection of each individual child attending an elementary school at regular age periods.

It obliges the local authority to acquaint itself at an early period with the physical, mental, and social conditions of practically every child within its district, and foreshadows, in no uncertain manner, the possible obligations that will be considered as necessary for

dealing with certain cases, if not the medical treatment of all school children who require it.

The use of hospitals and dispensaries, as suggested, appears novel, and it will be interesting to watch its effect on institutions essentially charitable.

It is probable that medical men will object to children, whom they consider should be their patients, being handed over to other practitioners who happen to be connected with institutions which were formerly charitable. Rate aid will also indicate rate representation, and it is not unreasonable to regard as probable that, with increasing municipal work, and declining charitable subscriptions, such institutions would become entirely rate-supported.

It is a matter for the future to decide how the treatment will be carried out, whether by a staff under the Health Department, consisting solely of specialists to deal with particular ailments, or by a general public medical service, part of the duties of which will be to medically treat school children.

It is possible that a further centralisation may take place, similar to that made by the Education Act, 1902, which abolished school boards and made the local authority responsible for elementary education, by placing the Poor Law service under the sanitary authority for administration. Such a unification might be suitable for supplying treatment in selected or special cases, or eventually forming part of a general public medical service.

At the present moment it behoves every medical officer responsible for advising on the manner in which the work of medical inspection should be organised, to keep in view developments that may possibly be necessary, and so shape the ground-work that future extensions may take place with as little disturbance and waste as possible.

DR. ASPINALL MARSDEN, of Lightcliffe, Halifax, having written to the Local Government Board with respect to the outbreaks of lead poisoning in Yorkshire and Lancashire, has received a reply stating that the Board "proposed to require all medical officers of health for districts having plumbo-solvent public water supplies, to include in their annual reports a statement as to any, and, if so, what action has been taken during the year in regard to this matter."

NOTES ON INFANTS' MILK DEPÔT STATISTICS.

By SIDNEY DAVIES, M.D., D.P.H.,
Medical Officer of Health, Woolwich.

THE natural impulse of a medical officer of health who has started a milk depôt is to get out and publish, as soon as possible, a death-rate, showing the improved health of children fed with depôt milk. But when he comes to examine his figures, he finds that this is a much harder task than he imagined. The infantile death-rate is usually given as the number of children dying under one year of age to 1,000 born. The children who die are not necessarily all among those who are born, many of whom may have moved out of the district and died elsewhere. For a population with average stability, this gives satisfactory results, but it is quite impracticable to apply this method to the children fed by a milk depôt. In the first place, their age distribution differs from that of the population under one. The numbers under one month are very few, and fewer still under one week. Secondly, the depôt milk is only taken for a few weeks or months, and the question arises as to whether a child who has had depôt milk for only a few days or few weeks is to be classed as a depôt-fed child. Thirdly, the depôt children are not average children—more than half of them are distinctly delicate or ill when admitted to the depôt.

Obviously, then, a depôt death-rate cannot be calculated in the same way, and cannot be strictly comparable with a general infantile death-rate.

If all the children who were on the depôt in any year could be followed up, so that it could be definitely stated that out of 100 children fed 90 were alive at the end of the year, it would not be very misleading to say that the depôt death-rate was 100 per 1,000; but owing to frequent removals this must be in most cases quite impossible. But when 100 children are fed in a year, and it is known that five have died, whereas there is no information as to how many are living, it would surely not advance scientific knowledge to say that the death-rate of the depôt is only 50 per 1,000.

It would, of course, be possible to exclude from the statistics all infants who could not be traced at the end of the year, but as these

would mostly be children over six months, their mortality would be low, and their exclusion would unfairly raise the depôt death-rate.

It seems, therefore, wiser either to make reservations when giving a death-rate, as is sometimes done, or, better still, to give no death-rate at all.

On the other hand, it is most desirable that as detailed figures as possible should be given for comparison, and statistical information including the following:—

Total number fed in the year—

Average number being fed at one time—

Average age on admission—

Average duration of feeding—

Number dying while on depôt:—

(1) In first week—

(2) In following three weeks—

(3) Afterwards—

Number known to be alive at end of year—

„ well on commencing—

„ unwell „ „

„ weighed at least three times at fortnightly intervals—

„ average gain per month—

Of course, detailed figures on many other points are desirable, but if all depôts would publish statistics under the heads mentioned, it would be practicable to compare to some extent the work of different depôts.

Perhaps the most correct death-rate that can be given for a milk depôt would be the number of deaths of children while on the depôt per 1,000 of the average daily number fed—excluding deaths within a week of commencing depôt milk. This method would no doubt give a much higher rate than that published for most depôts; but seeing that half the children are delicate or ill, a death-rate above the average is to be expected. A milk depôt death-rate is perhaps rather to be compared with a hospital death-rate than with that of average children.

The death-rate for breast-fed infants was found by Dr. Howarth to be 70 per 1,000, and though the calculation of any such rate is to some degree open to the same difficulties as a depôt death-rate, this low rate probably fairly represents the advantage breast-fed children have over hand-fed.

A depôt death-rate cannot be expected to

better that of breast-fed children, and if a lower rate is got, this at once suggests that the figures are not comparable.

Seeing that deaths in the first week of life are mainly due to premature birth, and antenatal and parturient conditions, and that they are very little affected by feeding, it would seem desirable to exclude them from all statistics as to different methods of feeding infants.

Deaths under one week form more than one-sixth of the total deaths under one year, and their exclusion would very much emphasize the difference between death-rates at later ages under varying conditions. Comparisons of infantile death-rates should strictly take into consideration age distribution for each month of life, and Sir Shirley Murphy, in his last annual report, has given a life table which would enable this to be done for London, but its application would involve much labour.

At a recent meeting of the Glasgow Health Committee's Sub-committee on Infantile Mortality, Dr. A. K. Chalmers made the following report on the dairies that undertake the sale of the milk supplied from the Corporation Milk Depot. "I have visited all the dairies where Corporation milk is being sold, and find them unsatisfactory in the following ways:—(1) They are constantly changing their girls, and each newcomer throws the work back. (2) These girls are quite unable to give any information or help to mothers who may be in difficulty with regard to hand feeding. (3) They keep no accurate account of their customers—the date of beginning or ceasing, etc. (4) They allow customers to drop off after two or three days' trial without endeavouring to find out the cause. (5) They do not realise the necessity of giving a child of a definite age a definite strength of milk. They seem to think if they do not have the size required the next size will do as well. The whole state of matters may be summed up by saying that there is an absolute lack of interest shown by the dairies. Their attitude is that they will sell the milk so long as they get fifteen per cent. and are not troubled for details. I would suggest that the committee consider the idea of selling milk from the Charity Organisation premises in Soho Street, Mile End. I feel sure that the most satisfactory work is done where the milk is given out under the supervision of some capable woman who is interested in each infant, and who can help the mother in many ways." The sub-committee recommend that the suggestion as to the sale of milk at the Charity Organisation premises be entertained.

OUTBREAK OF ILLNESS CAUSED BY VERMIN-DESTROYING VIRUS.*

By W. COLLINGRIDGE, M.A., M.D., D.P.H.,
Medical Officer of Health, City of London.

I HAVE to report on an outbreak of illness which has occurred in a business establishment in the City, where a large number of persons are employed of each sex. Between July 18th and 22nd, twelve men became seriously ill, the symptoms being severe headache, vomiting, diarrhoea, cramp in the abdomen, giddiness, and in many cases severe collapse.

There was also fever, with high temperature, and the patients looked, and were, extremely ill. The severe symptoms lasted about forty-eight hours, but each case recovered and was practically convalescent at the end of a week.

These symptoms pointed to infection by some bacteriological poison, and portions of the stools of three of the patients were sent to Dr. Klein for examination. He found a bacillus predominating in each specimen he examined, which he regards as undoubtedly the cause of the illness.

Inquiries were made with a view of discovering whether the symptoms were due to any article of food which had been eaten, but the whole of the staff, both male and female, were supplied with the same food, which was cooked and prepared in a common kitchen.

The only thing which was common to the persons affected, was the fact that they had all dined in the same room, and that no person suffered who had dined in either of the four other dining rooms.

In the course of investigation, an offensive smell was noticed in the dining room in question, and on removing the boards a large number of bodies of mice were found more or less in a state of decomposition.

Inquiry was made as to whether any poison had been laid down, and it was then discovered that some of a much advertised virus had been purchased and placed about the dining room and also in the pantry adjoining.

This virus is stated in the advertisement to cause a fatal contagious disease amongst rodents, but to be harmless to domestic animals and human beings.

A tube of this virus was purchased and submitted to Dr. Klein. He has made an

* From the Report of the Medical Officer of Health of the City of London, for the fourteen weeks ending 17th October, 1908.

exhaustive series of experiments which proved conclusively that the organism found in the stools of the patients is identical with the organisms of the virus.

This virus was laid about on pieces of bread, and it is easy to conceive that mice eating this virus might carry the contagion about on their feet to the floors, food, shelves, chairs, tables and plates, and thus it could infect the human beings dining in this room.

There are several of these viruses on the market at the present time, each of which claims to do the same thing, viz., the destruction of rodents and also to be innocuous to domestic animals and human beings. These are exposed for sale in the windows of chemists, and as the principal of all these viruses is the communication of a disease to rodents, it is in my opinion extremely undesirable and even dangerous that they should be allowed to be sold and purchased by any person. If they are to be used, they should be placed about with the greatest precaution and under skilled supervision, and I recommend that a copy of this Report be sent, together with the Report of Dr. Klein's bacteriological examination, to the Local Government Board urging the desirability—in the public interest—of putting restrictions upon the sale of such poisons to members of the general public.

DR. KLEIN'S REPORT.

It will be in your recollection that your Inspector brought here three stools from patients on July 22nd; they had been voided and placed in sterile test tubes on July 21st. One further stool was brought here on 23rd July, voided on same day.

All four stools were fluid, and were labelled S. (1), L. (2), W. (3), S. (4).

Nos. 3 and 4 had a dark green appearance; No. 1 was quite colourless, and No. 2 had flakes and some blood pigment.

These stools were all dealt with in the same manner, viz.: to discover in them the presence of any microbe of the Gaertner group, generally associated with gastro-enteric trouble, or of the microbe which predominated.

Of each stool five drops were diluted with 5 c.c. of sterile salt solution, and then from this dilution one large and two small plates containing Drigalski-Conradi medium were made and incubated.

The result of the incubation of these plates was briefly stated thus: besides some colonies of streptococci, the great majority—in fact, the predominating number of colonies—were those of a microbe which was neither *B. coli communis* nor *B. Gaertner*. Although it presented certain characters by which it might be considered either the

one or the other, it possessed other characters by which it could be distinguished from both.

The accompanying table shows the cultural characters of the microbe, named here microbe S. (1), and it will be noticed that it comes nearer to *B. Gaertner* than to *B. coli communis*. In respect of the appearance of the colonies on Drigalski-Conradi medium, in surface and shake gelatine, in neutral red broth, in litmus, lactose peptone, in bile salt neutral red agar, and also in respect of indol reaction, it materially differs from *B. coli communis*, whereas in respect of neutral red broth, gelatine shake culture, and particularly in respect of agglutination, it differs from *B. Gaertner*.

But the two points in which this microbe S. (1) stands out as quite distinct and specifically important are the following:—

(1) Dr. Hanson, on July 25th, was kind enough to supply me with three samples of blood, drawn in my presence with capillary tubes, from three convalescents that had walked up to his office; a fourth sample from a convalescent was drawn and sent on July 31st; neither of these convalescents were the patient S. from which microbe S. was derived.*

The blood serum of these samples was tested for agglutination in dilutions of 1.20, 1.40, 1.60, and 1.100 on broth cultures (24 hours incubated) on the following microbes:—

(1) *B. coli communis* of the same plates.

(2) *B. Gaertner* kept in sub-cultures in the laboratory.

(3) The microbe S. 1.

The result of these tests was that the blood serum did not agglutinate either *B. coli communis* or *B. Gaertner*, but it markedly did so microbe S. 1, this latter showing definite and distinct clumping within 15-20 minutes; blood serum 1.60 and 1.100 agglutinated it completely within twenty minutes.

(2) The second important point is this:—A small guinea-pig was injected subcutaneously with about $\frac{1}{4}$ c.c. of a 48 hours' old broth culture (of microbe S. 1); next day it was quiet, showed a big swelling about the seat of inoculation, and did not take its food; the animal was found dead in about 40 hours since injection.

On post-mortem it showed hæmorrhagic œdema about the seat of inoculation—stomach, duodenum and first part of jejunum pale and distended and filled with grumous fluid. This fluid, on standing, deposited flakes and turbid fluid; the flakes were composed entirely of detached masses of epithelium, so that we had here a condition like that found in cholera asiatica.

From the blood of the heart and from the turbid fluid of the duodenum the microbe injected was isolated in great numbers. A blood culture was tested with blood of convalescent of July 31st, and showed distinct agglutination within thirty minutes in same dilutions as above.

(*) A fifth sample from a different convalescent, who had quite recovered, was obtained on August 15th. This blood, however, when tested, had less pronounced although distinct agglutinating action than the blood of the convalescents of July 25th and July 31st.

I received also on July 31st one Agar culture of the virus*. This was used for studying and comparing it with the other microbes isolated from the stools and for agglutination test. As will be seen from the Table, there is a distinct similarity in cultural respects between microbe S. No. 1 and the virus microbe. A difference between the two microbes, viz., S. 1 and the virus microbe appears in respect of agglutination, since the former agglutinated in a marked manner with convalescent's blood, whereas the latter showed under the same conditions a feeble reaction only. As a further important point it ought to be stated that the microbe, isolated in great numbers from

the blood of the above injected guinea-pig, proved in cultural respects, as also in respect of agglutination, the same as the microbe S. 1.

Subcutaneous injection of $\frac{1}{4}$ c.c. of broth culture (24 hours' old) of the virus into a large guinea-pig caused extensive gelatinous necrotic swelling in groin, abdomen and chest, the animal after 40 hours being quiet, off feed and very ill. Exactly the same result was obtained in a companion large guinea-pig injected with $\frac{1}{4}$ c.c. of broth culture of microbe S. 1.

E. KLEIN.

August 20th, 1908.

Nature of Test.	<i>B. coli communis.</i>	<i>B. Gaertner.</i>	Microbe Secker 1.	Virus Microbe.
Morphological ...	Short rods, fairly motile.	Oval to cylindrical, very motile.	Oval to cylindrical, very motile.	Oval to cylindrical, very motile.
Surface gelatine ...	Dry, opaque.	Dry, translucent.	Dry, translucent.	Dry, translucent.
Shake ordinary gelatine	Copious gas.	Gas.	No gas.	No gas.
Shake glucose gelatine ...	Copious gas.	Copious gas.	Gas, slight, after 3 days.	Gas, very slight, after 3 days.
Ordin. broth and Phenol broth.	Uniformly turbid.	Uniformly turbid.	Uniformly turbid.	Uniformly turbid.
Indol reaction after 4 days.	Positive.	Positive.	Negative.	Negative.
Neutral red broth ...	Fluorescent, green.	Fluorescent, green.	Orange.	Orange.
Litmus lactose peptone	Acid, gas.	Negative.	Negative.	Negative.
Litmus milk (3 days) ...	Acid clotted.	Alkaline, fluid.	Alkaline, fluid.	Alkaline, fluid.
Litmus lactose bile salt peptone.	Acid, gas.	Bleached, no gas.	Bleached, no gas.	Bleached, no gas.
Litmus glucose bile salt peptone.	Acid, gas.	Acid, gas.	Acid, slight gas.	Acid, slight gas.
Drigalski-Conradi plates	Red colonies with red halo.	Blue colonies.	Blue colonies.	Blue colonies.
Bile salt neutral red agar	Red colonies.	Negative.	Negative.	Negative.
Agglutination (broth culture 24 hours' old) with convalescent's blood 1:60.	Negative in one hour.	Negative in one hour.	Positive within 20 minutes.	Partial, but distinct in 30 minutes.

September 11th, 1908.

Since I sent in my report on the S. microbe and a virus microbe, I have made several series of comparative experiments, which, I think, prove conclusively the identity of the two microbes.

The experiments are the following:—

(1) Both microbes injected subcutaneously separately into guinea-pigs cause the same kind of hæmorrhagic oedema extending over large area.

(2) Mice fed with either microbe (broth culture on bread) become ill and die in five to seven days with the same post-mortem appearances.

(3) Rabbits injected subcutaneously with either microbe developed extensive tumour; the animals are quiet and off feed for several

The culture tube was sealed with paraffin, and according to direction was not to be used "later than August 17th, 1908."

days, but are quite lively and feed again by the end of the week.

(4) Blood serum of a rabbit recovered, no matter whether S. microbe or virus microbe had been used for injection, clumps in a marked manner a broth culture of twenty-four hours' incubation of both microbes almost instantly indiscriminately, that is to say: S. culture is clumped equally well by blood serum of S. rabbit or virus rabbit, virus microbe is clumped equally well by blood serum of virus rabbit or S. rabbit.

E. KLEIN.

In view of the serious issues raised by these facts, and the increasing use of these and other cultures of a like nature, it will be necessary to continue the investigations into all such preparations sold within the City.

THE FEEDING OF SCHOOL CHILDREN.

THE Liverpool Corporation have recently issued the interim report of the Special Committee appointed "to investigate the subject of the insufficient or improper feeding of school children." The report, which consists chiefly of a preliminary report by Dr. Hope, the medical officer of health, relates to an investigation of twenty selected schools—the majority being schools attended by children of the poorer classes. The inquiries were made under the direction of the medical officer of health, who was assisted by fourteen medical men in the employ of the Corporation.

The methods upon which the investigation was carried out are thus described by Dr. Hope:—

The inquiry followed the lines of the plan submitted to the committee by the medical officer, who interviewed each member of the staff engaged in the investigation, notwithstanding that they all had had previous experience of inquiries of a kindred nature, and he also visited some of the schools during the progress of the inquiry.

Absentees, as far as possible, have been dealt with either by re-visits to the school or visits to the homes.

Assistance of a most valuable kind was given by the managers and teachers in the schools, whilst the health committee allowed the services of a number of their officers to be given during the course of the inquiry.

The very wide investigation asked for by the council has been restricted, as the committee thought expedient, to twenty schools in the first instance, involving some 19,000 scholars.

Twelve of the schools are attended by children whose parents usually belong to the labouring class; the remaining eight are attended by children whose parents are dependent upon less precarious incomes.

Without entering into details of procedure, it may be stated that the initial questions were asked through the teacher. Care was taken to gain the confidence of the child, as far as possible, before making the necessary special inquiries. This method is the only effective one, and even in these cases the actual facts are not always arrived at, children from the same household frequently giving widely different stories; hence a considerable number of these cases had to be followed up by inquiry at the homes.

The report contains much interesting information of the conditions found in the various schools embraced by the inquiry, and Dr. Hope concludes with the following general observations:—

It would appear that the number of meals supplied by voluntary aid equals, if it does not exceed, the number supplied by the meals committee.

It will be seen that improper and injudicious feeding is exceedingly common, and by no means restricted to the poorer classes.

The members of the committee will already, no doubt, have perused the results of investigations carried out in the city, and extending over many years, in regard to infant feeding, and they will be aware of the highly encouraging results which followed on proper instructions and advice being given to mothers. There is no doubt whatever that when proper feeding of children is better understood, very great advantages will result, this aspect of the question being by no means associated with poverty. Habitual use of improper food produces every evidence of malnutrition. Education in the matter of feeding will save a great deal of this malnutrition, and will also avert much of the waste of food which takes place in the houses of the poorer classes. It may be pointed out that in the discussion at the city council, which gave rise to this inquiry being ordered, no mention whatever was made of the class of children who, perhaps, above all others, require consideration, and that is the class who are not of the school age.

The purview of the city council must, of course, embrace these children, and that their needs are not less than those of school children is sufficiently obvious.

In large numbers of cases children may be seen running home with their food, the object very frequently being to share it with the little brothers and sisters. This matter requires a very careful consideration, and will not be satisfactorily met by merely compelling the school child to consume its food upon certain premises. One illustration is worth giving—the K— family. A little bare-footed child, about five years of age, received her supply of bread and jam, and was followed home through the rain to the cellar in which she lived. The medical officer, on entering the cellar, found two other children who attended other schools, who had also arrived with their share of bread and jam, and the three of them were proceeding to divide the meal with two others who were not of school age. The mother stated that they did this when their father was out of work. Latterly he had been in hospital, but was returning to work the following day. She also stated that she had had thirteen children, seven of whom had died in infancy or early childhood.

The matter does not come within the scope of the reference from the city council, but the committee may feel disposed to dissociate itself from any suggestion that there are less responsibilities in connection with children below the school age than with those who are attending school.

A series of cases which give rise to reflections of a much less agreeable kind, are those where the father is seen to be eating his meals while the children are looking on. It is difficult to account for this singular perversion of parental instinct, and it can only be classed with other cases of cruelty and neglect which from time to time receive the attention of the Society for the Prevention of Cruelty to Children.

There is an unfortunate but fairly widespread practice amongst many of the labouring classes in certain districts for the father to take his dinner

first, and for the rest of the family to take theirs afterwards; moreover, it is exceedingly common in slovenly households for the food to be left strewn about practically the whole day.

With reference to the proposal to apply the Education (Provision of Meals) Act of 1906, there appears to be an impression that considerable time would be taken up in formalities, should it at any time be found necessary or advisable to make use of the provisions of the Act.

It will be noticed that no delay is involved in its application beyond what would arise in sending a communication to the Board of Education; practically the provisions of the Act are available at any time.

It must not be forgotten, however, that the Act safeguards authorities against imposition, and some of the conditions would be more irksome upon parents than the system of inquiry connected with the present arrangements for voluntary feeding. No doubt these safeguards are inserted with a view to prevent an encroachment upon the province of legally constituted authorities upon whom the duty of relieving destitution devolves.

It remains to be added that apart from the information gained during the inquiry, which bears directly upon the resolution of the council, information of a very useful kind has been obtained, and the investigation has been attended with useful results in various directions, not least in disseminating knowledge on the question of proper feeding.

In an appendix to the report there are a few detailed accounts of visits to the children's homes and to the cocoa rooms, by members of the female staff of investigators, and Dr. Hope concludes by recommending an extension of the inquiry to an additional twelve schools.

PROTRACTED INFECTION IN TYPHOID FEVER.—Herr E. Huggenberger, of the Bacteriological Institute, Zurich, has issued a report on a series of thirteen cases of typhoid occurring in one family. The cases occurred in the following order—(1) Mother in 1877. (2) Father in 1888. (3) Son in 1892. (4) Daughter-in-law in 1902, and (5 to 13) nine servants from 1899 to 1908. During this period the family occupied three residences, in all of which typhoid occurred in the family. Prof. Erisman suggested that the infection was due to a carrier case, and a bacteriological examination was made of the dejecta of all the present members of the family, with the result that virulent typhoid bacilli were found in the faeces of the mother, who since her attack in 1877, had shown no symptoms of the disease. The medium employed in the examination was a jar prepared with sulphite of calcium, sugar of milk, and fuchsin (Endo's method). The agglutination test in the case of the mother also gave a positive result. As precautionary measures, the mother was advised to have her motions carefully disinfected, to disinfect bed-clothes and underclothes, to wash her hands with an antiseptic solution, to keep away from the kitchen, and to have nothing to do with the preparation of food.

FATIGUE IN SCHOOL CHILDREN AS TESTED BY THE ERGOGRAPH.

IN the *American Journal of the Medical Sciences* for November, 1908, there is an interesting article with the above title, by Dr. Rowland G. Freeman, lecturer on Pediatrics in the University and Bellevue Hospital Medical School, New York. Dr. Freeman's attention was directed to the subject by some experiments with the ergograph, that were made by Dr. W. S. Christopher, in the Chicago public schools. Dr. Christopher, found that there was a diminution in the physical activity as shown by the ergograph, beginning within an hour from the opening of school and proceeding until the noon recess, after which about the same activity was shown as at nine in the morning, with a diminution in the afternoon. The amount of deterioration in muscular activity during the school day, as shown in these children, was in the first experiments from 20 to 25 per cent., but a later average of 1,127 records of one school showed a morning loss of 16 per cent., and an afternoon loss of only 4 per cent., the difference in the two sets of experiments being attributed to a re-arrangement of the curriculum. Dr. Freeman, guided by Dr. Christopher's results, carried out a series of experiments in New York, which he thus describes:—

My first efforts to measure fatigue in school children were undertaken at the Charlton School three years ago. Two tests for fatigue were then used: that suggested by C. Ward Crampton, of New York, which consists in obtaining the difference between the blood pressure of a child standing and in a horizontal position, and the rapidity of the heart action in a child standing and in a horizontal position. This test was used in combination with a test by an ergograph devised by Dr. Thomas A. Storey, and kindly lent to me by Professor Lombard, of Ann Arbor, in which the abductor indicis was used; each movement of the index finger towards the thumb raising a weight and making a tracing on a kymograph. Throughout this work I have been much indebted to Professor F. S. Lee, of the department of physiology of the College of Physicians and Surgeons, of Columbia University, for his wise advice and the laboratory facilities and laboratory apparatus put at my disposal.

With these two tests I used children who were first required to concentrate in their studies; that is, children of about seven years. Absolutely no appreciable evidence of fatigue was obtained from the Crampton test of blood pressure and pulse rapidity, and no general fatigue such as that described by Dr. Christopher was obtained by the use of this ergograph. Although slight fatigue

was usually shown by some children, no persistent marked fatigue was ever found in any class of children.

The following year I continued the same experiments with the same apparatus in older children at the Charlton School with similar results. One ambitious and conscientious girl of high standing, with an acute mind, who was anæmic and poorly nourished, showed constant fatigue after her morning work. Some others showed occasional fatigue, others none.

Having worked for two years with very little result in this school, I arranged during the past winter to conduct work in the public schools, and through the courtesy of Health Commissioner Darlington and Superintendent Maxwell of the Board of Education, and Superintendent Boyle, of Public School 69, I was enabled to obtain the facilities that I needed. I used for this purpose at first girls eleven years old, taking first a group of five whom their teacher thought were fatigued at the end of the school day. These children, who were apparently showing some fatigue, showed no marked fatigue such as Dr. Christopher observed in Chicago. Other groups of five children of the same age that were afterwards taken gave similar results. I therefore concluded that further work with this ergograph was useless, either in order to confirm or obtain conclusions on the work done by Dr. Christopher.

I then procured a Mosso ergograph, similar to the one used in Chicago, which was kindly lent to me by Professor Howell of Johns Hopkins University, and to this was attached an adder. This Mosso ergograph uses the flexor of the middle finger. It was arranged so that each flexion of the middle finger raises a weight, makes a tracing on the kymograph as well as registering the amount of work done on the adder. In the use of this apparatus the method followed in Chicago was adopted, each child pulling 7 per cent. of his weight thirty times a minute for one and one-half minutes, thus giving each child about forty-five pulls.

With this apparatus I have tested a considerable number of children in a New York public school and have obtained results exactly similar to those obtained with the other form of ergograph which I previously used. While some children show fatigue in their tracings after an interval of school work, other children will make better tracings than at the beginning.

Twenty children tested 9.30 a.m. showed an average of 264 kg. cm. of work; at 11.30, 286; at 1.30, 272, and at 3.30, 250. This shows a slight increase in muscular activity at 11.30 over 9.30, and again a slight diminution at 2.30 as against 1.30.

An average of 36 observations at 9.30 and 11.30 on both boys and girls from ten to fourteen years of age, gave an average result of 278 kg. cm. at 9.30, and 282 kg. cm. at 11.30, a slight increase in the amount done at 11.30 over 9.30. As some of these children were using the instrument for the first time on this day, an estimate of the work done by children who had repeatedly used the ergograph might help to eliminate this possible error. Eleven

children familiar with the instrument did an average of 204 kg. cm. of work at 9.30, and 256 at 11.30, so that there seems no way that we can use these figures to obtain results similar to those obtained by Dr. Christopher. This may be accounted for by a difference in the school curriculum. It is possible that the duties required of the pupils in Chicago are more difficult and that the sessions possess less opportunities for recesses. This would, of course, alter the results. As I have been unable to obtain the curriculum used in Chicago, I cannot compare it with that used in New York.

As a conclusion, I might say that the Crampton test for fatigue has given negative results as applied to school children in New York; that the Storey ergograph, as used for the detection of fatigue in school children, has given negative results, and is unsuitable on account of the use of accessory muscles when the abductor indicis becomes fatigued; that the Mosso ergograph, combined with an adder, as used in the Chicago public schools, is the more reliable instrument for this purpose, but in my hands fails to give evidence of marked fatigue of the pupils during the school day in a private and also in a public school of New York City; and that in occasional children either form of ergograph will give evidence of fatigue.

The ergograph, so far as my work indicates, is of no value in modifying the school day in the public schools of New York for the average student, but might be shown to be of value in lightening and controlling the work for those pupils who give evidence of marked fatigue during the school day.

FALSE WARRANTY OF CAMPHORATED OIL.—At Brentford Police-court, Messrs. Auburn and Heaviside, wholesale chemists, Battersea, were recently summoned for having given a false warranty with certain camphorated oil supplied to John Bernard, an Isleworth grocer. Inspector Tyler stated that in June he took a sample of the oil at Mr. Bernard's shop, and on analysis it was found to be deficient in camphor to the amount of 11.75 per cent., according to the standard in the British pharmacopœia. Proceedings taken against Bernard were dismissed on proof being given that he purchased the oil from the defendants with a warranty, and a summons was issued against the wholesale dealers. For the defence Mr. Wilfred Firth contended that camphor, being very volatile, lost its strength through evaporation during the hot weather. At the time the warranty was given it was quite correct, but some weeks elapsed between the delivery of the consignment and the taking of the sample. Mr. Edward Bevan, official analyst to the Middlesex County Council, gave evidence that, if properly compounded, the camphor would not decrease in weight in the oil except after a long time. He considered that the compound had not been properly prepared in the first instance. The Bench convicted and imposed a fine of 40s.

ANNUAL REPORTS.*

By SIDNEY C. LAWRENCE, M.B., D.P.H.

Medical Officer of Health, Edmonton.

THE Annual Report is a "hardy annual," if ever there be one. Let me remind you of the Biblical story of the two sisters, Mary and Martha. It is a matter of some trouble to the Marthas—did I say the Martyrs?—of the public health service who heave a huge sigh of relief when the necessary copies have been sent to the Local Government Board and the County Council; they then joyfully feel that they have secured at least half their salary for the next twelve months. On the other hand, there are the callous or easy-going Marys who leave their annual reports to the last possible moment, and then with transcendent ability put its pages together as fast as a "nuthrown maid" can string her beads.

The first indication one has of the "Annual Report season," is a blue paper document from the Local Government Board (a "memorandum" it is called) which is usually dated 23rd December, and *always* directed to "the Clerk." This misdirection has one advantage, because it prevents the medical officer of health receiving it, until he has had his fill of Christmas jollity and the New Year is dawning. But, as the first of the conundrums I am offering you for solution this evening, I put it to you seriously:—

Query 1.—Why should this document be addressed to the Clerk? This habit has many obvious disadvantages—if there is a single advantage, other than the above-mentioned, I shall be glad to hear of it. The memo. is not marked "confidential," and, as I have said it is directed to the "Clerk"; but I am inclined to think that the nature of the instructions to the medical officer of health make the document of a confidential nature, and I should like to have your opinion on this point.

Query 2.—How many copies of the annual report should be printed? There are at least seven copies actually essential. They are for—1. Local Government Board; 2. County Council; 3. Home Office (at least their own tables); 4. British Museum; 5. The Local Authority; 6. The Medical Officer of Health

* Read as an introduction to a debate on "Annual Reports" at a meeting of the Home Counties Branch of the Society of Medical Officers of Health, Friday, 23rd May, 1906.

himself; 7. The Library of the Society of Medical Officers of Health. These must be provided, whether the report be printed or not. But the Local Government Board document says:—"It is *very* desirable that the annual report should be printed," and it gives two reasons therefore:—1. "facility of reference" (by whom?) 2. "in order that a supply of copies may be available for distribution amongst the councillors and *other persons interested*." Who of you will define the limits expressed by the last three words "other persons interested?" A ratepayer,—poor unhappy man!—at least must be a person interested in the health of the district, and the value he is getting for his money! Therefore, I suppose the Clerk should be supplied with enough copies to provide every ratepayer with one. In my district there are only 11,000 ratepayers! How many are there in yours?

Query 3.—The annual report is addressed to the sanitary authority. See No. 14 of the statutory duties of the medical officer of health, and page 1, par. 1 of the memo.; but page 3, par. 1 of this latter reminds us that the annual report is also for the information of the Local Government Board and of the County Council. The question whether the medical officer of health's report should be printed or not is (page 1, par. 1 of the memo.) a matter for the local authority's discretion.

Query 4.—Is it usual for the annual report to be submitted in draft before it is printed? If a council decline to print it—then I presume the absolutely necessary seven copies must be prepared by your own hand or the type-writer.

Query 5.—Have a council power to print only such portions as they think fit, and yet publish it as "the annual report of the medical officer of health"?

Query 6.—What should the tone of the annual report be? The *British Medical Journal* says:—"The medical officer of health should not lose sight of the fact that what is wanted is *his* report as a sanitary specialist, and not the report of his council, or any of its committees; he should aim at making it a full and *fearless* account of the sanitary condition of his district, and the causes which affect it, whether favourably or unfavourably; and where the local sanitary authority had failed to carry out his recommendations, it is his duty to the district and himself to mention such facts."

THE BILSTON URBAN DISTRICT COUNCIL AND THEIR MEDICAL OFFICER OF HEALTH.

IN the August number of PUBLIC HEALTH, under the proceedings of the Midland Branch, appeared an account of the extraordinary step taken by the Bilston Urban District Council in giving notice to Dr. Ridley Bailey, the medical officer of health of the district, to terminate his appointment as medical officer of health at the fever hospital, together with the resolution passed by the Council of the Society on the matter.

The attention of the Local Government Board having been directed to this question, the Board sent down an inspector to inquire and subsequently with the district council and strongly their view, that in such a district there were great advantages in the union of the offices of medical officer of health, and medical attendant at the fever hospital in one medical man, and advising against the course proposed by the district council.

It appears that the views of the Local Government Board did not find favour with the district council, some of whose members are stated to have expressed the opinion that it was best for the district that the appointments be divided up among the medical men of the district; the council, therefore, determined to continue on its own course in spite of the advice of the Board. The local division of the British Medical Association, having been approached on the matter, the appointment was placed in the "warning notice" of their Journal and in the *Lancet*; and when the urban district council met to make the appointment, they found that there were no applicants for the post. In the discussion which ensued, it is reported that one member stated that he considered that the greatest mistake had been made in treating the communication of the Local Government Board with contempt, and it had "recoiled on themselves." Another member is reported to have said that, "It seems that we shall have to eat the leek whether we like it or not." In the end no applicant being available, the re-appointment of Dr. Bailey was carried.

After nearly twenty-four years of work as Medical Officer of Health for Bilston, unin-

The tone should not be, I think, one continuous flow of flattery of your council and sanitary committee; if so, truth would be shamed! Nor yet a Jeremiad of omission and commission on the part of your council, but (as the Government advise) a full and explicit record of any improvement or deterioration in the sanitary circumstances, *i.e.*, the influence affecting, or threatening to affect, *injuriously* the public health, and a report of the action that has been taken or may *still be needed* to combat these injurious influences. What previous advice of his has been ignored, the medical officer of health is particularly requested by the Government, to repeat *ad nauseam*. Brave words!

Query 7.—When is a resident not a resident? Are you quite satisfied with the definition given by the Local Government Board? Only recently, I was asked to include amongst Edmonton deaths those of several people who had resided in an asylum outside my district for periods varying from ten to twenty-five years! Their last known private address was given vaguely as "Edmonton."

SCHOOL HYGIENE IN FRANCE.—MEDICAL INSPECTION AS A SAFEGUARD AGAINST THE SPREAD OF INFECTIOUS DISEASES.—Recent experience in Paris has demonstrated the difficulties which beset attempts to control the spread of infectious diseases in elementary schools by continuous medical inspection. In the presence of severe outbreaks of measles and scarlet fever, the Prefect of the Seine gave instructions on the 17th of March of this year that medical inspectors in Paris should make bi-weekly visits at the opening of classes in all the schools in their districts during the continuance of the epidemic. It was found impossible to carry out this instruction owing to the time the examinations took, and the impossibility of certainly distinguishing these diseases in their early stages. Accordingly, representations were made to the authorities, with the result that on the 28th of May the instruction was withdrawn. Instead, the supplementary visits were left to the discretion of the inspectors, while the diseases remained prevalent; but greater precautions were enjoined with regard to exclusion of children. All children excluded are to be rigorously kept out of school by teachers until a medical certificate is received stating that they are quite free from infection. This certificate may be signed by the family doctor or by the medical inspector. For this purpose the children are not to attend school upon the visiting days of the inspector, but must attend at his private residence to be examined.—*La Médecine Scolaire*.

interrupted by any cause of complaint, Dr. Bailey is to be congratulated on the result obtained. That such an appointment should be subject to the caprice, or the petty change of political majority of a local council is one of the evil features of the tendency to the excessive de-centralization of local government. The fact that considerable advantages may result from the close association of members of the medical profession in common action for the welfare of the profession and the public, is well brought out by the termination of the incident.

Dr. Bailey has been the recipient of a great number of congratulations; and medical officers of health generally will congratulate not only Dr. Bailey, but also the district council in that the council, in spite of itself, is to retain the services of an admittedly efficient officer, and that the two posts are not to be under separate control.

THE ANNUAL REPORT OF THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD.

IN submitting the latest annual report of the work carried out by the Local Government Board's medical department, Dr. Newsholme points out that the report is concerned entirely with the work of the department during the tenure of office of Sir W. H. Power, and he pays a graceful and well-merited tribute to the work of that distinguished epidemiologist, who, although he has retired from office under the Board, is still serving the State as Chairman of the Royal Commission on Tuberculosis, and as a member of the General Medical Council and of the Royal Commission on Sewage Disposal. The present report is considerably less bulky than its predecessors, the change apparently being due to the discontinuance of the practice of reproducing in full the reports relating to some of the more important medical inspections made during the year under report. An abstract of the medical inspections, however, is given, and there is a valuable appendix on "Local Housing Conditions and Administration," which is illustrated by extracts from the medical inspector's reports in 1906-7.

In addition to the record of the administrative work of the department, the report contains, as in previous years, an account of the auxiliary scientific investigations. There is a report by Dr. Klein of further researches in connection with the organophylaxis and organ-therapeutics of plague, from which it appears that there is reason to think that certain organs of an animal that has recovered from plague, or that has been rendered

immune against plague, may possess considerable therapeutic potency. Drs. Andrewes and Gordon contribute a report on the defensive mechanisms of the body against infection by the pyogenic cocci, in which they deal with the question of bacteriolytic defence. Dr. Savage, the medical officer of health of Colchester, has two reports, one on the bacterial contamination of milk, the other on the distribution of the Gaertner group of organisms in the animal intestine. In the former report Dr. Savage states that he found that *B. coli* and the glucose fermenting organisms in general were almost invariably absent from milk samples obtained direct from the udder; and in examining milk samples from cows suffering from certain inflammatory conditions of the udder he found a streptococcus which closely approximates to one of the types of streptococcus found in association with scarlet fever in man. This question, it is stated, will receive further investigation. Dr. Horder reports on the micro-organisms associated with rheumatic fever, and Dr. Sydney Martin makes a preliminary report on the action, and the chemical products of the streptococcus *foecalis*.

One of the most important of the special reports is that contributed by Dr. Andrewes on the micro-organisms present in sewer air and in the air of drains. Dr. Andrewes shows that under many ordinary circumstances, characteristic sewage bacteria are to be found in the air of sewers and drains, and that it is a mistake to think that sewage does not readily give up its bacteria to sewer air. The evidence brought forward in this report is summarised by Dr. Andrewes as follows:—

(1.) "In Section III. I have shown that the streptococci of drain air, when tested as to their biological characters, are found to correspond, almost in their entirety, with those of sewage, and only to a slight extent with those which chiefly abound in fresh air. The types of streptococci which are most abundant in fresh air were not found in the air of sewers and drains.

(2.) In Section IV. I have shown that bacilli of the colon group obtained from drain air correspond essentially in their biological characters with those of sewage, and that such bacilli can only be obtained from fresh air or not at all.

(3.) Lastly, it is shown that a test microbe, added in bulk to the contents of the drains under suitable conditions of splashing, can be recovered locally from the drain air in great numbers, and can also be recovered from the air at considerable distances (50 feet and 390 feet) from the point at which it was added to the sewage."

Dr. Andrewes is still continuing his researches, and a further report will be published shortly. The subject is one of great practical importance to public health administrators, who will await the result of Dr. Andrewes's continued experiments with much interest.

SANITATION IN SHANGHAI IN 1907.*

By ARTHUR STANLEY, M.D., B.S. Lond., D.P.H.,
Health Officer, Shanghai.

THE foreign sanitary inspection staff is now composed of four inspectors and fourteen assistant inspectors. The inspectors, with one exception, are fully qualified, while two of the assistant inspectors possess the Sanitary Inspector's Certificate of the Royal Sanitary Institute. It is proposed, by a system of yearly examination and a syllabus of instruction divided into three stages, the passing of each stage carrying a bonus, to increase the efficiency of the assistant inspectors, who are usually recruited locally, so that they may, when vacancies arise, be promoted to inspectorships, with full charge of a sanitary district.

Chinese dwellings.—As an extension of the work of the systematic limewashing and disinfecting of Chinese dwellings, an attempt was made to improve ventilation and lighting by opening up back premises and removing overhead stages and high partitions within rooms. The overcrowding met with was deplorable; rooms large enough to provide sleeping accommodation for four persons being frequently used for as many families; the sanitary condition being rendered worse by dividing the rooms by partitions which shut out the air and make them permanently dark. The sanitary inspectors were brought directly and sympathetically into touch with the Chinese, facilitating the explanation of the benefits of disinfection, vaccination and other sanitary measures. Many houses thus disinfected, visited three or four months afterwards, were still found in a clean and healthy condition, but the greater number had relapsed into their former condition of oriental squalor. After a fair trial, it was concluded that until there was some effective legislation against overcrowding, little lasting benefit could be expected. A rule dealing with overcrowding is recommended for inclusion among the conditions of license of native lodging-houses.

The need for solid basement floors may again be emphasised. At present the space left between the floor boards and the ground becomes a receptacle for any filth that finds its way between the floor boards and provides a comfortable home for rats. When plague comes to Shanghai, this circumstance above all others will prolong infection, resulting not only in great sacrifice of life but in diminished trade of the port. Architectural tradition requires a ventilated air space below the floor boards to prevent rotting of the floor. But wooden floors, laid directly on good concrete, either bedded in cement or in tar, or any simple antiseptic insoluble in water, will last longer than when a ventilated open space is left below.

Foreign dwellings.—The attention of architects is called to the clause in the Public Health Notice headed "Kitchen," wherein it is suggested that every house should, if possible, have a separate larder (place for storing uncooked food), kitchen

and serving-room. The serving-room should be fitted with a washing-up sink, an efficient filter, shelves for all the table utensils, groceries, &c., and room for the ice-chest. It is held that the separation of the serving-room from the kitchen is an important means of preventing those food infections which are so prevalent in Shanghai, and which are brought into a house chiefly by infected vegetables. Cooking destroys the infective material, and food that leaves the kitchen should reach the table without contamination. This can be ensured by having the table utensils kept in, and the service of food done from, a serving-room kept quite separate from the kitchen. As an additional safeguard, a place for the washing and preparation of vegetables prior to cooking should be provided in the yard outside the kitchen. A great number of foreign houses lack proper serving-rooms, and use the space under the staircase for that important purpose. This space is usually too small, dark, ill-ventilated, and is often without washing-up sink. The wooden zinc-lined sinks are frequently abominable, and glazed earthenware sinks with proper waste pipes of lead should replace them.

Those about to rent houses are advised to ask the Health Officer for a sanitary inspection, and a certificate of good sanitation before closing with the landlord.

House refuse.—The difficulties in the organisation of an effective system of removal of house refuse by Chinese wheelbarrow from the house to the shoot having been overcome in 1906, attention was directed during the past year to improvement in the method of removal of house refuse from the refuse shoots by boats. The question of disposal by burning was first considered, and the conclusion arrived at was that, as long as house refuse could be effectively disposed of by boats, it would be undesirable to attempt disposal by burning, which would entail great initial cost for installation of works, and a working expenditure at least as great as the present method. In order to prevent dumping of refuse into the waterways, which has been a source of complaint by the harbour master for many years, the system of payment of the contractor, who barges away refuse, was altered from payment in a lump sum for removal from the shoots without reference to mode of disposal, to payment per ton actually landed at the depôts, while the removal of house refuse by country boats, destined for use for agricultural purposes, was encouraged. Now, the contractor takes delivery of the refuse at the shoots, sells as much as he can to the country boats to be used for agricultural purposes, and barges the rest to the dumping depôts up the Whangpoo (opposite the Arsenal) and Soochow Creek (Siau-sa-doo), 15 cents a ton being paid for each ton landed at the depôt, ascertained at the end of each month by cubic measurement on the spot, while 25% of the proceeds of the sale of house refuse to the country boats reverts to the council.

Drainage and paving.—It has been considered a duty in the ordinary course of sanitary inspection, not only to point out sanitary defects, but also when

requested to provide the means whereby these defects can be best remedied, and to supervise the work to completion. In this way the native contractors have been taught the proper way of laying drains, forming cement channels, paving yards and other sanitary work.

The defect usually met with, in the course of inspection, is that of blocked surface drains, due to absence of proper surface inlets. A hinged grid to gully traps, with lineal openings, instead of the small circular openings at present used, would be a great advantage. Although the standard of drainage is improved, much is still required before the materials used are laid so as to obtain the maximum amount of self-cleansing, and able to stand the test of hard wear and tear. A good deal of the cement drainage material used by private contractors is very badly made. If none but those made at the municipal factory were allowed, considerable sanitary improvement would result.

Stagnant Water.—As a result of the vigorous filling-in operations of previous years, little stagnant water exists near buildings within the Settlement. It is generally admitted that the number of mosquitoes has been reduced, and, as a result, the cases of Malaria.

Creeks.—Regarding these important natural tide-flushed drains, the object has been the abolition of stagnant water and the maintenance of tidal channels open, clean and clear. The Yangkinpang continues as bad as before, and, considering that nothing has been done in the way of cleansing or improvement for some years, that its condition is not far worse tends to show that it has a worse name than it deserves.

Laundries.—All the laundries within the Settlement are licensed and regularly inspected. The system of sanitary control has been one of constant inspection, so as to make the licensees reluctant to transgress the terms of their licenses rather than one having for its object a large number of mixed court prosecutions. It should be noted that the coolies carrying washing to and from the licensed laundries are provided with municipal distributing tickets, so that residents can easily identify the licensed laundries. It is advisable to insist on seeing this ticket from time to time, as there are several insanitary laundries outside the Settlement, especially in Pootung, which it is impossible to license. If the public, including the shipping community, were not to patronise these insanitary laundries, they would soon cease to exist.

Lime-washing.—During the year, all the licensed laundries, dairies and shops were twice lime-washed by the occupiers. An account of the systematic cleansing and lime-washing of native dwellings will be found under "Chinese dwellings."

Waterclosets.—Applications are still received from time to time for permission to instal waterclosets. Foreign Building Rule 76 is now, however, quite clear and definitely prohibitive under all circumstances. The main object is the safeguarding of the water supply.

Public Latrines and Urinals.—In June two new latrines were opened to the public in Li Hongkew which led to the removal of a large number of insanitary ordure pits.

The practice of coating urinals with crude petroleum has greatly improved their conditions, preventing deposit in a remarkable manner. Crude petroleum was also used in public latrines as an anti-cholera measure. It will probably be used every summer in future to prevent flies and, as a result, the diseases carried by them.

Public Health Notices.—A large number of Public Health notices have been distributed among foreign householders. Public Health notices for the Chinese have also been widely circulated and recited in the alleyways and tea-houses by the foglemen. A notice having for its object the prevention of tuberculosis was also distributed among the Chinese.

PUBLIC HEALTH AND THE POOR LAW.*

By R. A. Lyster, M.B., B.Sc., D.P.H.,

County Medical Officer of Health, Hampshire
(Late Medical Officer of Health, Handsworth).

THE old problem of Poor Law administration is constantly brought before all medical officers of health. In their ordinary work they frequently meet genuine cases of need, and in still more instances they have such cases reported to them. Unfortunately, however, they can usually do nothing officially. Both friendly suggestions and simple reports appear to cause irritation and resentment on the part of relieving officers and all officials connected with the Poor Law administration. One would imagine, from common-sense principles, that there should be the closest intimacy between the public health organisation and the Poor Law work; in fact, it is obvious to those people who have given time and attention to the subject that public health and Poor Law work should be practically one public department. But at present it is impossible to imagine any two departments more isolated from each other, and the public good must continue to suffer until they are brought together.

The machine-like methods adopted in Poor Law administration are resulting in the overcrowding of workhouses, and have increased rather than diminished pauperism. It not only, in many cases, robs the poor of the little self-respect, courage, and independence that the stress of circumstances has left to them, but it also makes permanent paupers of many who, with a little outside assistance, would soon be able to hold up their heads before the world. Wise and humane discrimination is the essential part of successful charitable effort, and the public charity which treats all cases alike is as unwise as the private generosity which gives to all cases, whether

From the Annual Report on the Health of Handsworth, 1907.

MIDWIVES' NOTES.

SEVERAL county medical officers, in their annual reports for 1907, comment on the forthcoming situation with regard to midwives in 1910. The following suggestion is made in the Derbyshire report:—

"I am convinced that the only way to meet the difficulty . . . is to grant, on certain conditions, annual licenses to practice in rural districts. The present system is satisfactory for urban districts, but the conditions which have to be complied with, and the examination which has to be passed, are too stringent for midwives in rural districts. What I would suggest is, that a modified examination be held locally for candidates desiring to practice in a neighbourhood where they are known, and that the local medical practitioners' opinions be obtained on the suitability of the candidates. Candidates satisfying the examiner should be granted an annual license to practice in their own parishes, subject to the supervising authority reporting annually that they are observing the rules of the Midwives' Board."

A definite and practical suggestion, thus put forward with all the prestige of the county medical officer for Derbyshire, and founded on the experience of an authority supervising 347 midwives in all kinds of districts, deserves serious consideration. Postponement of the law by an amending Act would be a retrograde step. Not to enforce the law, when it comes into operation, would be to stultify and weaken the whole force of public health administration. Enforcement of the law will doubtless cause many inconveniences, difficulties and even dangers to the more casual and ignorant of mothers in outlying districts; and it is natural to aim at preventing these drawbacks by legislating and making use of the women who have hitherto done the work.

But the proposal is inadmissible. It was precisely for the getting rid of untrained women in the absence of trained medical men that the law was passed; the difficulties of such a clearance are inevitable; the law, after showing the greatest consideration for these women, has decided to face the difficulties in 1910, in mass, after five years' preparation; to soften down the attack would be to lose once and for all the opportunity of appealing to the humanity of the nation to fill up the void.

Moreover, as medical men, we must not admit the existence of any serious difficulty, except that of finance, with which those responsible must grapple. The whole country is served by medical practitioners, and all a prospective mother in an outlying part has to do after 1910 is to arrange with the nearest medical man or with the parish doctor to be responsible for the case. In most cases the confinement will pass off exactly as before, with the same "handy woman" conducting operations under the merely nominal supervision of the practitioner. Indeed, this is the case in a large proportion, probably a majority, of outlying confinements now, with the exception that there is often not even any nominal medical supervision, and that when anything goes wrong, the "handy

deserving or not. The present Poor Law methods appear to have fostered a grovelling and shiftiness among the poor, because it is found that such characteristics are the surest passports to assistance, while the few who have preserved their original sturdy independence, and who constitute the very best type of the poor, regard the whole system with very obvious horror.

My reason for introducing this subject into a health report is that it is inseparably connected with the public health. Poverty and disease work on each other in a vicious cycle. Among the poor there is a vast amount of infectious illness continually present. Many of such cases remain unreported, untreated, and practically unknown. They serve, however, as a continual and ever-present focus for the spread of such diseases among the general public. There is thus constituted a most grave public danger. The only possible way to remove such a danger is to devise improved and more easily available means for treating these cases. Treatment and prevention are inseparably associated in practically all diseases. The one is essentially the complement of the other. By adequately providing for the early recognition and the proper treatment of all disease, an almost incredible improvement in the public health would rapidly result. The mere existence of disease, altogether apart from any consideration as to whether it is accompanied by destitution or not, should be sufficient to ensure proper medical treatment, if the public are to be relieved of the ever-present dread of the sudden and rapid spread of infection.

As a typical illustration of the great waste of money entailed by the present methods of Poor Law administration, I may mention a case that occurred in this district. Two cases of scarlet fever occurred in a family of six children. The mother was a widow with no income. There was sufficient room in the house for the proper isolation of the cases, and they could have been nursed at home if a little help could have been obtained. Every possible effort was made to get assistance from the Poor Law authorities but without success, and the cases were removed to the isolation hospital. Nine days later two more children had to be removed, and ten days later still another two. The total cost to the district for the treatment of these cases was £55, whereas a total allowance of £5, or even of food only, would certainly have prevented this unnecessary expense. This is a single instance. The sacrifice of life, health, and money resulting from the untreated cases of disease is beyond estimation.

For ordinary cases requiring relief, everyone agrees that the closest investigation should always be made in order to separate the deserving case from the parasitic type that is unfortunately so common. But no such investigation should be required in cases of disease. In such instances it is not the individual but the public good that should be considered, and it is of urgent public importance that all such cases should be treated without one moment's delay. Only by such methods will a successful attempt be made to check the continual spread of disease.

woman" proves her good but ignorant intentions, and no one is to blame. In 1910, if we take proper steps, through the police and otherwise, to make the law known, those "handy women," who intend to continue practising will, if they are wise, make arrangements with medical practitioners to work under their supervision; the medical men will be glad, or will feel morally bound thus to spread their nets, and their responsibility will eventually and gradually lead to the improved skill and carefulness of those on whom they have to rely for the conduct of all but abnormal labours.

If, on the other hand, some of the "handy women" are unwise or crafty, and propose to continue their practise in defiance of the law, it will be easy for a vigilant administration to call them to order and subject them to the necessary condition of medical supervision without altogether suppressing them. It will be still easier to suppress them where there is a satisfactory substitute.

The whole question is one of finance. The medical man should be paid for his responsibility, if the responsibility be real; and it is an aim of the Act to make this responsibility far more real than it at present in many cases is. The community, through Parliament, has demanded that the mothers of the nation shall be safeguarded in their peril; that henceforth every confinement shall, if possible, be conducted under the direct responsibility of a trained midwife or trained medical man. The community has commandeered these private services, which man or woman has a right to dispose of at his or her own valuation; the community, where necessary, must pay the cost.

It is a case for the maternity charities and the poor law; and the report of the Poor Law Commission is due this year. This, then, should meet Dr. Barwise's case; and the more we show up the hardships impending on outlying districts, the sooner shall we persuade the guardians, on behalf of the people whom they represent, to make adequate provision for the medical fee, where the patient is unable to pay.

But the increasingly academic standard of modern medical practice and the diminishing entries into the profession are loosening its hold every year on the practice of normal midwifery, and the Midwives' Act expresses a far-sighted policy of providing a body of women sufficiently trained to take over the drudgery of this work and to know when to call in medical aid. When, therefore, the medical man is unwilling to take over the responsibility of normal midwifery amongst the poor in outlying districts—and it is, in our experience, far more often humanity than self-interest that prompts him to continue it—there is the call for the properly trained midwife and for the operation of the reformed Poor Law, or, in its default, for charitable persons and county nursing associations.

Finally, can we blind our eyes to the frequent complaint of medical men that even the fully-trained nurse has often dangerously little knowledge, and that the midwife born of the C.M.B.

has often still less, and is often sent out into the world with only six months' nursing experience under the full veneer of the nurses' uniform? How is it possible to approve the licensing of yet a third grade of "nurse," on the strength of a little *bonâ fide* practice, an examination in mere rudiments, and chiefly the existence of a supposed need in the locality due to public "economy," to compete with and oust the fully-trained nurse from every parsimonious and small-minded community in turn?

The ideal of sound medicine and nursing alike is to establish trained responsibility in every case of labour, with reference to medical skill in the event of abnormality; and to encourage the provision of skilled nursing and midwifery for every street and village, with at least the minimum requirements for midwifery of the C.M.B. The nation in 1910 has to bear the brunt and face the whole of it without further postponement or lowering of standards. It is a question of finance and adjustment of duties. Medical officers of health must continue to urge the nation to rise to the occasion.

Hertfordshire started its County Nursing Association by a meeting at Lord Salisbury's house on October 1st, with Lord Clarendon in the chair, and an influential and representative list of supporters, to form the General Council. A training home for village nurse-midwives is to be established in Watford, giving six months' training in nursing and in midwifery. Medical officers of health and general practitioners are well represented on the executive committee and on the sub-committee for management of the training home. This is the 19th County Nursing Association now at work.

Under this heading, in the issue for October, comments were given on a case originally stated to have occurred in Northamptonshire. We are now informed that it occurred in the County Borough of Northampton.

HEREFORDSHIRE COUNTY COUNCIL.—APPOINTMENT OF COUNTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER.—At a meeting of the Herefordshire County Council held on October 10th, it was stated that a committee of the council had not been able to come to an agreement with Dr. Herbert Jones, who was elected county medical officer of health and school medical officer on August 29th, as to the terms under which he should hold the appointment. The principal point of difference is the stipulation by the county council that all qualified medical assistance required should be provided, not, as is invariably the case elsewhere by the council, but by the medical officer of health. The council decided again to advertise the appointment upon the same terms, in spite of the warnings of several members that no medical practitioner of standing would be found to accept the post under the proposed conditions.

REVIEWS.

THE PREVENTION OF TUBERCULOSIS. By Arthur Newsholme, M.D., F.R.C.P. Methuen, pp. 429. Price 10s. 6d.

Tuberculosis may be studied from many points of view. Dr. Newsholme for years has studied it from the point of view of the public health administrator, to whom the prevention of disease is the all-important consideration, and in the present volume, which embodies the results of his experience and research and the conclusions to which he has been led, he has produced a book for which medical officers of health may be devoutly thankful, not only for the wealth of information it contains, but also for the object-lesson it affords in the art of presenting difficult and complicated subject-matter in a highly condensed form, and yet without loss of lucidity or thoroughness of treatment. The book consists of three parts: The first deals with the "Causation of Tuberculosis"; the second, the "Means by which the reduction of mortality from Tuberculosis already obtained has been secured"; while in Part III. the author discusses the "Measures for the reduction and annihilation of Tuberculosis."

In the first part, Dr. Newsholme gives a conspicuously fair and impartial account of the chief views that are held on the causation of the disease, but he makes it clear that he is one of those who regard case to case infection as the factor of paramount importance. In stating the evidence for this view, he gives the results of an interesting inquiry into a hundred consecutive sanatorium cases of phthisis, which were very carefully investigated at the Brighton Sanatorium by the late Dr. H. C. Lecky. In this series a history of definite exposure to infection was obtained in 32 per cent. of the cases; in 23 per cent. there was a possibility of such infection; in 18 per cent. exposure to infection was suspected, but the history was defective and indefinite, while in 25 per cent. no exposure to infection could be traced. These cases, several of which are stated in detail, afford evidence that in tuberculosis there may be a period of latency of many years. In some of the cases the infection appears to have been latent for over twenty years. Dr. Newsholme discusses the importance of hereditary predisposition as an etiological factor, and he agrees generally with Koch's statement that "though hereditary tuberculosis is not absolutely non-existent, it is, nevertheless, extremely rare, and we are at liberty in considering our practical measures, to leave this form of origination out of account." He maintains that the results upon which Professor Karl Pearson bases a contrary opinion "depend in fact upon hypotheses which may not be accepted generally as justified, and upon ascertained data which may be regarded as too few to warrant conclusive inferences." He criticises the wet soil theory, and is inclined to think that much of the benefit ascribed to drying the soil was really due to other factors that began to operate at the same time.

In the second part of the book, Dr. Newsholme puts forward his hypothesis that the decline

in tuberculosis has been due to the influence of institutional segregation. This exposition is a brilliant example of the use of statistics in sociological investigation. The author uses statistics as an anatomist uses the scalpel, to separate the important and essential from the unimportant and unessential, and he certainly succeeds in presenting a very strong case. The facts are marshalled with consummate skill, and the whole exposition, quite apart from the interest of the subject, will be found well worthy of study by all who are called upon to apply statistics to complex phenomena. It is impossible to appreciate the force of the argument without following it in detail, but the subjoined extract indicates the methods by which Dr. Newsholme has arrived at his conclusions:—

"We have examined the records of a large number of communities exhibiting the respective variations of the several factors affecting the death-rate from tuberculosis side by side with the variations of this death-rate. Each of these factors was thus tested in the actual experience of many large communities over the same period of history. In the series of communities subjected to the test, institutional segregation was the only factor of which the variation was always associated with a variation in the prevalence of tuberculosis in a constant relative direction. It would not have been surprising had the influence of institutional segregation been masked by that of opposing factors, as has been seen to have occurred in many countries with the important influence of urbanisation; or contrariwise, it would not have been surprising if more than one influence had varied with the prevalence of tuberculosis in a constant relation. In either case, the question as to which influence had predominated in affecting the prevalence of tuberculosis would have been left open. In fact, however, no influence except that of institutional segregation has appeared in actual experience in a constant relation to the amount of tuberculosis, and it must, therefore, be accepted as having been the predominant influence."

In Part III. Dr. Newsholme discusses the subject of prevention, and although he does not neglect the value of measures of general sanitation and social amelioration, he naturally attaches greater importance to the more direct methods of prevention. He takes a hopeful view of the future, and sees no reason why, if attacked in the right way, "tuberculosis should not follow the closely allied disease of leprosy towards extinction."

The book is not free from small errors. A negative is obviously omitted from the first line on page 264, the reference to tuberculous lunatics on page 274 must have escaped the author's corrections, and we find it difficult to see the force of the argument on page 259 in its present form. These, however, are minor matters, and do not detract from the merit of the book, which should be read by all who are interested in the great problem of the prevention of tuberculosis.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

A GENERAL MEETING of the Society of Medical Officers of Health, took place on Friday the 13th November, 1908, at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C. *Present*:—Dr. Edward Sergeant, President (in the Chair), Drs. F. J. H. Coutts, R. A. Lyster, R. M. Craven, A. M. Davis, J. S. Tew, A. Griffiths, J. Tate, C. Sanders, J. R. Kaye, A. Bostock Hill, S. C. Lawrence, J. Tubb Thomas, E. H. Snell, E. C. Seaton, W. Butler, A. K. Chalmers, W. H. Symons, Sir Shirley F. Murphy, C. W. F. Young, R. Green, Herbert Jones, G. C. Taylor, G. Sowden, R. A. Glegg, L. M. Bowen Jones, A. H. Hogarth, R. Harper, A. W. McFadden, H. Peck, W. M. Hamilton, J. T. Neech, and W. Whitaker, F.R.S.

THE PRESIDENT having taken the chair, it was resolved unanimously, that the minutes of the last ordinary meeting held on April 10th, 1908, having been printed and published in PUBLIC HEALTH for May 1908, be taken as read, and they were duly signed by the Chairman.

THE HON. SECRETARY read a list of nominations for the election of Fellows and Associates.

ELECTIONS.

The following Candidates who had been duly nominated were balloted for and declared by the President to be elected unanimously:—

AS FELLOWS.

Grace Stewart Billings, M.B., B.S., Sussex Lodge, Cheltenham. E. F. Bywater, M.B., Ch.B., D.P.H., Isolation Hospital, Muswell Hill; Hornsey U.D. (Assist.) George S. Clark, M.B., Ch.B., B.Sc., 13, Braid Avenue, Edinburgh. J. M. Clements, M.D., D.P.H., Undercliffe, Batley; Batley M.B. Catherine L. Corbett, M.B., Ch.B., D.P.H., Knighton House, Queen's Road, Coventry; Coventry Educ. (Assist.) R. M. Courtauld, M.A., M.B., D.P.H., Borough Sanatorium, Brighton. D. P. M. Farquharson, M.B., C.M., Bank House, Radcliffe, Lancs.; Radcliffe U.D. Joseph P. Frengley, M.D., D.P.H., Wellington, N.Z. Jane Gilmore-Cox, M.B., C.M., Education Offices, Dovecot Street, Stockton-on-Tees; Stockton-on-Tees Educ. (Assist.) Walter L. Hawksley, M.B., Ch.B., D.P.H., City Hospital, Fazakerley, Liverpool. A. H. Hogarth, M.B., Ch.B., D.P.H., Toynbee Hall, London, E.; Buckingham C.C. Helena B. Jones, M.B., B.S., D.P.H., 80, Bunbury Road, Kings Norton; Kings Norton and Northfield. A. E. Kidd, M.B., D.P.H., Inglewood, Carnoustie N.B.; Monifieth P.B. Henry C. T. Langdon, M.R.C.S., L.R.C.P., 367, High Road, Chiswick, W.; Westminster City (Assist.) F. C. Linton, M.A., M.B., D.P.H., Isolation Hospital, Norwich; Norwich City (Assist.) Jno. W. Miller, M.D., D.P.H., Town Hall, Hereford; Hereford City. Thomas Orr, M.B., Ch.B., B.Sc., County Hall, Wakefield; W.R. Yorks C.C. (Assist.) Edith Oversby, M.B., Ch.B., Surrey House, Barbourslee, Worcester; Worcester C.C. Educ. (Assist.) C. Grant Pugh, M.D., D.P.H., Municipal Buildings, Southend-on-Sea; Southend-on-Sea M.B. Cecil A. Reynolds, M.B., Ch.B., D.P.H., Abbey Foregate, Shrewsbury; Shrewsbury U.D. M.B., Ch.B., D.P.H., Isolation

Hospital, Winchmore Hill, N. James R. Watson, M.D., D.P.H., Peebles, N.B.; Peebles P.B. A. E. Williams, M.D., D.P.H., Prestatyn, N. Wales; Flint C.C. Educ. Maxwell Williamson, M.D., B.Sc., City Chambers, Edinburgh; Edinburgh City.

The President then delivered his Presidential Address upon 'County Health Administration.'*

SIR SHIRLEY MURPHY moved a cordial vote of thanks to the President for his most interesting address. He said that Dr. Sergeant's work as a medical officer of health, first of all for the important town of Bolton, and later for the County of Lancaster was very well known, and full advantage had been taken of this great experience in those responsible positions, to place before them in a concise and most interesting form the duties and the obligations of county authorities. Although Dr. Sergeant had confined his remarks to what could be done under Acts of Parliament, much of the work of the county medical officer of health was of an advisory character, though it was fully justified by Acts of Parliament. At the present time public attention was being directed to the public health duties of county councils, and to the defining of those duties. There could be no doubt that Dr. Sergeant's address would contribute towards a solution of some of the difficulties which surrounded this question.

Dr. EDWARD SEATON in seconding the vote of thanks said, that he did so with peculiar pleasure because the President was a distinguished representative of the medical school of St. Thomas's Hospital with which he himself had been so long associated. He reminded the meeting that Dr. Sergeant succeeded in introducing compulsory notification of infectious disease into the town of Bolton at a time when compulsory powers were looked upon with a certain amount of disfavour and suspicion by the medical profession. The general adoption of compulsory notification has shown that even in those early days Dr. Sergeant was in the forefront of public health administrators, and the address which they had all listened to with so much pleasure was ample evidence that he had retained that position up to the present time.

Dr. J. R. KAYE in supporting the resolution referred to the importance of the Public Health Department of the County Council acting as a bureau of information, so that the local authorities might be supplied with the latest information concerning sanitary administration.

The resolution was carried with acclamation.

Midland Branch.—The Annual Meeting of this Branch was held at the Council House, Birmingham, on November 5th, at 3.30 p.m. *Present*: Dr. Orton (President), Dr. Reginald Green (President-elect), Drs. Bostock Hill, Robertson, Malet, Ridley Bailey, Henry May, Robinson, Wilkinson, J. W. Miller, Hamilton Wood, Sisam, Clendinnen, J. G. Beasley, Cowie, H. Manley, Basil Housman, Edith Oversby, Catharine Corbett, Peacock, F. H. May, and Snell.

A letter of regret was received from Dr. Brindley.

Dr. J. Orton having inducted his successor, Dr. Reginald Green, into the chair, Dr. Green proposed, and Dr. Robertson, seconded a vote of thanks to Dr. Orton for his services as President during the past year. Dr. Orton briefly replied.

The Minutes of the last two meetings of the council were read.

The Minutes of the last meeting of the branch were read, confirmed and signed.

The Treasurer's report was received, audited, and adopted.

Dr. Reginald Green then delivered his presidential address, on "Some figures from Medical Inspection."

Dr. Henry May proposed and Dr. Manley seconded a hearty vote of thanks to Dr. Green for his address, and Dr. Green replied.

A discussion then followed on the subject matter of the address, in which the following took part: Drs. Bostock Hill, Manley, Miller, Robinson, and Wilkinson.

It was then resolved to adjourn the discussion until a subsequent meeting.

North-Western Branch.—Minutes of a meeting held at the Chemical Club, Victoria Hotel, Manchester, on Friday, October 16th, 1908. *Present*: Dr. Hamilton (in the chair), Drs. Garstang, Greenwood, Hitchon, Welsh, Buckley, Young, Merry Smith, Chronnell, Dearden, Hibbert, Thomas, Arnold, Daley, Wilkinson, Edlin, Buchan, Wheeldon, Fraser, Holt, Pilkington, Berry, Corbin and Barlow (Dr. Marsden, visitor). Apologies for absence were read from Drs. Wheatley, Peck and Brindley.

The minutes of last meeting were read, confirmed and adopted.

The following were nominated for election as members of the branch:—Dr. Sydney Marsden, M.O.H., Birkenhead; Dr. Rees Jones, M.O.H., Blackpool; Dr. James Wood, Assistant M.O.H., Oldham; Dr. Lucy Pinniger, assistant school M.O., Oldham.

Read a letter from Dr. Hulbert, resigning his membership of the Branch, owing to his removal from the district. Resignation accepted.

Read a letter from Dr. Coutts, resigning his membership of the Branch and his post of Treasurer. Secretary reported that he had written to Dr. Coutts expressing the regret of the members of the Branch at losing his valuable services.

It was resolved on the proposition of Dr. Greenwood, seconded by Dr. Barlow, that Dr. Hitchon be appointed Treasurer, in succession to Dr. Coutts.

It was proposed, seconded, and carried, that one of the meetings for the ensuing session, be held at Liverpool, and another at Preston.

It was further resolved that the Annual Dinner of the Branch be held on November 27th. The Dinner Committee was recommended to invite the President and Secretary of the Chemical Club, the Presidents of the Veterinary Association, the President of the Liverpool and Manchester Medical Institutions, and the Lord Mayors of Liverpool and Manchester.

The President then read his Address, for which

a vote of thanks was unanimously accorded to him on the proposition of Dr. Berry, seconded by Dr. Pilkington, and supported by Dr. Marsden.

The Home Counties Branch.—The first meeting of the session 1908-9, was held on Thursday, October 15th.

The President, Mr. F. E. Fremantle, delivered his presidential address entitled "The Relation of Public Health to Parliament," which, at Mr. Fremantle's invitation, was followed by a discussion in which Drs. Crookshank, Sanders, Porter, Coates, Sowden and Blackler took part. The address was prefaced by an interesting and erudite survey of the public health legislation produced by parliaments previous to the present one; brief accounts were then given of the eleven medical men in the present House of Commons, and of our solitary representative, Lord Lister, in the House of Lords, and the opinion was emphatically expressed by the president that public health legislation would be improved in quality by a larger proportion of M.P.s. selected from medical and scientific circles to grace the two chambers of the legislature.

Dr. H. Ashby, of Reading, and Dr. Meredith Richards, of Croydon, were chosen as the elective representatives of the branch on the Council of the Society.

The Hon. Treasurer, Dr. Ashby, then submitted his accounts for the year, September, 1907 to September, 1908. These were audited by two members and approved.

The meetings of the branch will be held on the third Thursday of each month, at 5.0 p.m., at 1, Upper Montague Street, Russell Square, W.C.

MILK DEFICIENT IN FAT.—Before the Grantham borough magistrates, on October 19th, George Pougher was summoned for selling a pint of new milk on September 13th, without disclosing to the purchaser that a portion of the fat had been abstracted. Mr. S. F. Nott, inspector under the Food and Drugs Act, stated that on September 13th, he met a youth in Grantham delivering milk from a cart. He asked to be supplied with a pint of new milk, but the boy at first declined to let him have any, explaining that he had only sufficient for his customers. Mr. Nott then said that he required the milk for analysis, and the youth supplied him. On September 17th the public analyst certified that there was an abstraction of fat equal to six per cent. The defendant, in defence, said he could not assign any reason for the milk being deficient in fat beyond the fact that there was only a very small quantity left in the bottom of the can when the inspector was served and the top milk already served would contain most of the cream. No one touched the milk besides himself. There had never been any cream used or butter made on the farm from the milk since he had been there. The milk had never been interfered with in any shape or form to abstract any of the fat. He was perfectly innocent of any intention to sell milk below the proper standard. The bench convicted the defendant and imposed a fine of 10s. and 6s. costs.

INTERCEPTING TRAPS IN HOUSE DRAINS.

THE President of the Local Government Board has appointed a Committee to inquire and report with regard to the use of intercepting traps in house drains. The Committee consists of the following gentlemen:—Ludovic William Darra Mair, Esq., M.D., Allen Arthur Grenville Malet, Esq., M.Inst.C.E., and Harry John Pearson, Esq., A.R.I.B.A.

The Secretary of the Committee, Mr. E. Hardwick Terry, has sent the following letter to all the principal towns in England and Wales:—

29th October, 1908.

Sir,—The President of the Local Government Board has appointed a Departmental Committee to inquire and report with regard to the use of intercepting traps in house drains, and I am directed by this Committee to inform you that they will shortly be prepared to receive evidence on the subject from Medical Officers of Health, Engineers, Architects, and others having special knowledge of it.

With a view to assisting the Committee to select witnesses for this purpose, I am instructed by the Committee to inquire whether the officers of your Town Council would be prepared to give evidence should the Committee so desire, and, if so, to request that you will be good enough to forward to me at your earliest convenience, and not later than the 21st prox., a *précis* of the evidence they would propose to tender.

I am to add that the Committee are of opinion, at present, that their terms of reference will involve consideration of the need or otherwise of the intercepting trap; of any disadvantages of the trap; of the effect on the community of emanations from sewers or drains; to some extent also, of the ventilation of sewers and drains; and of the bearing of existing conditions on the question.

I enclose for your information a copy of the terms of reference to the Committee.

I am, Sir,

Your obedient Servant,

(Sd.) E. HARDWICK TERRY,

Secretary to the Committee.

To the Town Clerk.

MEDICAL OFFICER OF HEALTH FOR THIRTY-FIVE YEARS.—At the meeting of the Eye Town Council on November 4th, a letter was read from Dr. Edgar George Barnes, resigning the office of medical officer of health, a post he had held for 35 years. The resignation was accepted, and it was unanimously resolved that the town clerk be requested to convey to Dr. Barnes the thanks of the Council for the efficient and conscientious way in which he had carried out his duties during the 35 years he had held the office.

CORRESPONDENCE.

A QUESTION OF NUISANCE.

To the Editor of PUBLIC HEALTH.

SIR,—I shall be glad to know if any of your readers can assist me in the following matter. A kitchen, which is the only living room of the family, opens on to a yard by means of a door containing glass. There is a fanlight over it which is, however, fixed. There is, of course, a fireplace and also a door opening into the passage. When the door leading to the yard is open, there is an unpleasant draught on the feet and legs of the occupants, and the interior of the room is exposed to the observation of the neighbours. For this reason the outer door is never opened, and the room is practically without ventilation to the interior. The owner has been required to make the fanlight open and has failed to do so. The question is whether the conditions are such as would induce a magistrate to consider that the premises were a nuisance injurious to health. I should be very glad if any of your readers, who have had experience of such cases, would kindly communicate with me.

Yours faithfully,

SIDNEY DAVIES,

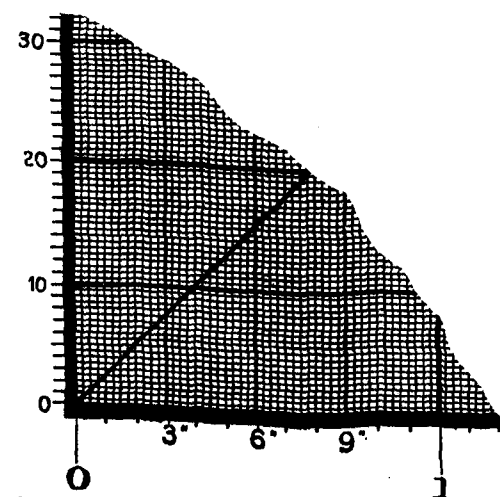
MEDICAL OFFICER OF HEALTH,
WOOLWICH,

October 21st, 1908.

THE VERSIMETRIC CHART FOR CONVERSION OF METRIC INTO ENGLISH MEASURES IN CONNECTION WITH THE MEDICAL INSPECTION OF SCHOOL CHILDREN.

To the Editor of PUBLIC HEALTH.

SIR,—The following block explains the charts which I have designed, on a suggestion from Dr. James Kerr, for use in the Hertfordshire schools, to all of whom it has been distributed.



The principle is simple. A square is ruled, the base of which is marked off in half inches, corresponding to 6-ft. 3-in., and the side marked off in centimetres corresponding to 190.5 cms., which is the known equivalent. Horizontal lines are drawn across the square representing centimetres; vertical lines down the square representing half inches. A thick diagonal line is drawn across the square between two opposite corners. The eye is easily run from any given figure in one scale across or upwards to the diagonal line and thence down or across to the corresponding figure in the other. For use in the schools two charts are made on this principle, for heights between 2-ft. 3-ins. (68.58 cms.) and 5-ft. 9-ins. (175.25 cms.), and for weights between 28-lbs.

(12.7 kgs.) and 168-lbs. (76.2 kgs.). These and several other charts for conversion of pharmaceutical weights and capacity, and of thermometric and other measurements, have been drawn up by Mr. T. W. Abbott, and are published by The Medical Agency, Watergate House, York Street, Adelphi, W.C.

For school purposes the charts are printed on Japanese paper 18-in. x 15-in., with a wooden roller along the bottom and a brass binding and hanger along the top, or on card.

Yours faithfully,

F. E. FREMANTLE,

County Medical Officer, Hertfordshire.

THE LIBRARY.

All Books and Publications received by the Editor and by the Hon. Librarian will be acknowledged under this heading.

Annual and Other Reports.

Royal Borough of Kensington. Registrar-General's Weekly Returns. Transvaal Government Laboratories, 1906-7. Report of the M.A.B. Monthly Bulletin of the State Board of Health of Massachusetts. Cape of Good Hope, 1907. Berkshire County Council, 1907. Bulletin du Service de Santé et de l'hygiène. Metropolitan Asylums Board. County Borough of Newport, by Dr. J. Howard Jones. Experiment Station Record, Washington. Bulletin of the Sleeping Sickness Bureau. Minute of Mayor of Capetown. Dr. Reginald Farrar's Report to the L.G.B. on Southwell R.D., Notts. Dr. F. St. George Mivart's Report to the L.G.B. on Westhamphett R.D.

Journals.

Lancet. British Medical Journal. Sanitary Record. Hospital. Giornale della Reale Società Italiana d'Igiene. Sanitary Journal. New Zealand Medical Journal. Australasian Medical Gazette. Journal of the R.A.M.C. Glasgow Medical Journal. Sleeping Sickness Bureau Bulletin. Medical Review of Reviews. American Journal of the Medical Sciences. Canadian Nurse. Official Circular of the County Councils' Association. Journal of the Royal Institute of Public Health. Tropical Medicine and Hygiene. American Statistical Association. Canadian Practitioner and Review. Water. Birmingham Medical Review.

Pamphlets.

High Frequency Effluvia and Sparking in the Treatment of Malignant Tumours. By Dr. J. A. Riviere, Paris.

Statutory Rules and Orders.

Draft Regulations for the Use of East Indian Wool.

Therapeutics of the Circulation.

by Sir Lauder Brunton, Bt., M.D., D.Sc., LL.D. (Edin.), LL.D. (Aberd.) F.R.C.P., F.R.S. John Murray, 7/6 nett.

Points of Practice in Maladies of the Heart.

by James Sawyer, Knt., M.D. (Lond.), F.R.C.P., F.R.S. (Edin.), F.S.A. Cornish Bros., Ltd., Birmingham.

Intracellular Enzymes.

by H. M. Vernon, M.A., M.D. John Murray, 7/6 nett.

A Manual of Infectious Diseases. 2nd Edition.

by E. W. Goodall, M.D., and J. W. Washbourn, M.D., F.R.C.P. H. K. Lewis, 14/- nett.

Principles and Methods of Physical Education and Hygiene. by W. P. Welpton, B.Sc. University Tutorial Press, 4/6.

School Hygiene. 2nd Edition.

by R. A. Lyster, M.D., D.P.H. University Tutorial Press, 3/6.

APPOINTMENTS.

A. H. LOWE, M.B., C.M. Edin., has been appointed Medical Officer to the Kesteven County Council for the Medical Examination of School Children.

T. W. ANDREW has been appointed Medical Officer of Health to the Hendon Urban District.

W. M. V. WILLIAMS, L.R.C.P. & S. Edin., has been appointed Medical Officer of Health to Colwyn Bay and Colwyn Urban District.

J. T. MCARTHUR, L.R.C.P. & S. Edin., has been appointed Medical Officer of Health to the Borough of Queenborough.

R. MILLAR, M.B., Ch. B., has been appointed Medical Officer of Health to the Darton Urban District.

H. SCHMITZ, M.B., C.M. Edin., has been appointed Medical Officer of Health to the Borough of West Hartlepool.

C. R. WOOD, M.D., has been appointed Medical Officer of Health, to the New Shoreham Port Sanitary District.

A. G. ANDERSON, M.A. Aberd., has been appointed the Medical Officer of Health to Rochdale.

A. B. McMASTER, M.D., B.Ch., R.U.I., has been appointed Assistant Medical Officer of Health to the Borough of Rochdale.

WILLIAM ARNOLD THOMSON, F.R.C.S., has been appointed Medical Inspector of School Children to the Borough of Maidenhead.

(Miss) H. A. HALL, L.R.C.P. & S. Ire., has been appointed Medical Inspector of School Children to the Walthamstow U.D.C.

Miss SOPHIA SEEKINGS, M.B., B.S. Lond., D.P.H. Cantab., has been appointed Assistant Medical Inspector of Schools under the Tottenham Education Committee.

J. P. CULLEN, M.R.C.S., L.R.C.P. Lond., has been appointed Medical Inspector of School Children in Devonshire.

H. E. GOULDEN, M.R.C.S., L.R.C.P. Lond., D.P.H. Cantab., has been appointed Medical Inspector of School Children in Devonshire.

HERMANN A. GUNTHER, M.B. Lond., M.R.C.S., L.R.C.P. Lond., has been appointed Medical Officer of Health to the Hampton Wick Urban District Council.

LEONARD R. TOSSWILL, M.R.C.S., L.R.C.P. Lond., has been appointed Medical Inspector of School Children in Devonshire.

C. J. COLEMAN, M.A., M.B., D.P.H., has been appointed Deputy Medical Officer of Health for the City of Lincoln.

G. S. MILL, M.D. Edin., M.B., C.M., has been appointed Medical Inspector of School Children for the Borough of Batley.

F. ROBINSON, M.D., D.P.H., has been appointed County Medical Officer to the Cambridgeshire County Council.

ROBERT BURNET, M.B., Ch. B., M.Sc., D.P.H., has been appointed Medical Officer of Health to the Bury County Borough, and Medical Officer to the Education Authority.

MALCOLM B. HAY, M.R.C.S., L.R.C.P., D.P.H., has been appointed School Medical Officer to the Gillingham Urban District (Kent).

F. A. SHARPE, M.B., B.S. Lond., D.P.H., has been appointed Assistant Medical Officer of Health to the Derby County Borough.

RECENT PUBLIC HEALTH LITERATURE.

Ankylostomiasis.

MANSON (Sir P.). Discussion on sanitation in reference to ankylostomiasis in the tropics. *Brit. Med. Jour.*, 1908, ii, 1347.

Anthrax.

EURICH (F. W.). The administrative control of anthrax. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 597.

Bacillus Coli.

BARBER (M. A.). The rate of multiplication of bacillus coli at different temperatures. *Jour. of Infect. Dis.*, 1908, v, 379.

Caisson Disease.

BOYCOTT (A. E.) and G. C. C. DAMANT. Experiments on the influence of fatness on the susceptibility to caisson disease. *Jour. of Hygiene*, 1908, viii, 445.

Crèches.

THOMAS (D. J.). Crèches and sanitary administration. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 609.

Crematoria.

MILLARD (C. K.). Construction and management of crematoria. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 539.

Diphtheria.

GOODMAN (H. M.). Variability in the diphtheria group of bacilli. *Jour. of Infect. Dis.*, 1908, v, 421.

Disinfectants.

DELEPINE (S.). The standardizing of disinfectants. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 577.

WATSON (H. E.). A note on the variation of the rate of disinfection with change in the concentration of the disinfectant. *Jour. of Hygiene*, 1908, viii, 536.

Flies.

HEWITT (C. J.). The biology of house-flies in relation to the public health. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 596.

Haemoglobinuric Fever.

PLEHN (A.). The cause, prevention and treatment of haemoglobinuric fever in warm countries. *Jour. Trop. Med.*, 1908, xi, 294.

Hospitals.

ALLBUTT (Sir T. C.). An address on hospitals; public medicine and medical studies. *Lancet*, 1908, ii, 1055.

Hygiene, Public.

EDWARDS (T. C.). A summary of industrial legislation from the mediæval period. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 553.—HEWETT (Sir J. P.). An address on sanitation in India. *Lancet*, 1908, ii, 1907. JONES (Lieut.-Col. J. A.). Remarks on the sanitary service of the Territorial force. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 568. WALFORD (E.). Sanitary progress in Cardiff. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 560.

Immunity.

GREEN (A. B.). Some experiments on immunity against vaccinia in animals. *Jour. of Hygiene*, 1908, viii, 521.

Infant Feeding.

PISEK (G. R.). Fallacious standards employed in artificial infant feeding. *Jour. Amer. Med. Assoc.*, 1908, li, 1214.—SOUTHWORTH (T. S.). High fat percentages in infant feeding. *Jour. Amer. Med. Assoc.*, 1908, li, 1219.

Influenza.

LORD (E. T.). The etiology of an epidemic of influenza. Relation of the influenza bacillus and

other organism to the recent epidemic in Boston (1907-08). Comparison with an inter-period (1902-4). *Jour. of Med. Research*, 1908, xix, 295.

Liver, Tropical Abscess of

CHARLES (Lieut.-Col. Sir R. H.). Discussion on tropical abscess of the liver. *Brit. Med. Jour.*, 1908, ii, 1235. ROGERS (L.). Tropical or amœbic abscess of the liver as a preventable disease. *Med. Press*, 1908, ii, 473.

Meningitis, Cerebro-Spinal.

CURRIE (J. R.). Abnormal re-actions to horse serum in the serum treatment of cerebro-spinal fever. *Jour. of Hygiene*, 1908, viii, 457.—CURRIE (J. R.) and A. S. M. MACGREGOR. The serum treatment of cerebro-spinal fever in the City of Glasgow Fever Hospital, Belvidere, between May, 1906, and May, 1908. *Lancet*, 1908, ii, 1073.—DUNN (C. H.). The serum treatment of epidemic cerebro-spinal meningitis based on a series of forty consecutive cases. *Arch. of Pediatrics*, 1908, xxv, 756.—FLEXNER (S.). An analysis of 400 cases of epidemic meningitis treated with the anti-meningitis serum. *Arch. of Pediatrics*, 1908, xxv, 747.—ROGER (B. F.). Epidemic cerebro-spinal fever: its clinical and pathological phases. *Arch. of Pediatrics*, 1908, xxv, 721.

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HEINEMANN (P. G.) and T. H. GLENN. A comparison of practical methods for determining the bacterial content of milk. *Jour. of Infect. Dis.*, 1908, v, 412.—HORROCKS (Maj. W. H.). On the use of lacto-sera as a means of distinguishing goat's milk from cow's milk. *Jour. Roy. Army Med. Corps*, 1908, xi, 450.—HOWARD JONES (J.). Necessity for a standard of cleanliness in all milking competitions at Agricultural shows. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 576.—KNOX (J. H. M. Junr.). The recent campaign for clean milk in Baltimore. *Pediatrics*, 1908, xx, 605.

Plague.

BUCHANAN (Lieut.-Col. A.). Cats as plague preventers. *Brit. Med. Jour.*, 1908, ii, 1231.

Refuse.

BOULNOIS (H. P.). Utilisation of residuals from refuse destructors. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 624.—STEELE (W. J.). Utilisation of residuals from refuse destructors. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 631.

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ARNOLD (M. B.). An outbreak of an acute infectious eruptive disease (Rubella). *Brit. Med. Jour.*, 1908, ii, 1331.

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WILLIAMS (R. P.). The medical inspection of school children. *Practitioner*, 1908, lxxxi, 725.

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HARVEY (T. F.). The Merthyr sewage farms. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 648.—STAMMERS (Maj. G. E. F.). Sewage disposal by slate beds at Devizes, Wilts. *Jour. Roy. Army Med. Corps*, 1908, xi, 522.

Sleeping Sickness.

TODD (J. L.). The prevention of sleeping sickness. *Brit. Med. Jour.*, 1908, ii, 1061.

Smoke Abatement.

THOMSON (W.). The use of coalite as a means for preventing atmospheric pollution. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 623.

Public Health

THE JOURNAL OF

The Society of Medical Officers of Health.

No. 4.

JANUARY, 1909.

VOL. XXII.

THE COMING OF THE SCHOOL CLINIC.

THE Education Committee of the London County Council have lately had before them one of the most important documents that have recently appeared on the subject of school hygiene. We refer to the Report of the Special Sub-Committee, appointed to "inquire into the whole question of the medical treatment of children attending public elementary schools," a short account of which will be found in our present issue. The committee's report is specially interesting, not only on account of the importance of the subject and the vast extent of ground covered by the inquiries, but also because of the representative constitution of the committee, which contained representatives of the British Medical and Dental Associations, and other institutions intimately concerned with the question of medical treatment. The findings of the committee possess, therefore, an unusually authoritative character, and the whole report should be carefully studied by all who are interested in the progress of school hygiene.

The committee, though not unanimous in all their conclusions, are in entire accord as to the grave need for further provision for the medical treatment of school children. The evidence for this need is set out in the appendices to the report, with an abundance of precise detail, which should rouse even the most confirmed adherent of the policy of letting things slide. The conditions brought to light by the committee's inquiries constitute nothing less than a grave national danger, and it must be impossible for any patriotic citizen to read this report without considerable uneasiness. It is not surprising to find that the committee are unanimous as to the need for something to be done. There

are, however, differences of opinion as to the nature of the remedial measures recommended. Two courses were considered by the committee:—(1) That the Council should arrange for treatment to be carried out by existing hospitals and dispensaries, subsidies being granted from the rates where necessary; (2) That the Council should establish school clinics, where treatment should be provided by medical officers appointed by, and responsible to the Council. The latter alternative is recommended by the committee; the former by the members of the committee, including the representatives of the Charity Organization Society, who have prepared a minority report. It is significant to note that the representatives of the British Medical and Dental Associations are among those members of the committee that recommend the establishment of school clinics, and it should be borne in mind that the subject has already received the careful consideration of the British Medical Association, who have decided against the method of State subsidies of charitable medical institutions, for the purpose of creating a claim on the benefits of such institutions for persons under State authority, on the ground that any State medical service "must be adequately organized, administered on a systematic basis, and clearly distinguished from work undertaken for charitable motives." The subject is by no means free from difficulty, but we venture to think that most of those who are acquainted with the methods of public health administration in this country, and whose chief concern is for the welfare of school children, will agree with the majority committee in regarding the school clinic as the most effectual and economical means for providing the measures of amelioration, which will be more and more imperatively demanded as the results of medical inspection become more generally known.

THE DEPARTMENTAL COMMITTEE ON THE MIDWIVES ACT.

THE Lord President of the Council has appointed a Departmental Committee to consider the working of the Midwives Act, with special reference to the following matters:—(1) the supply of midwives and the cost of training midwives; (2) the remuneration of medical practitioners summoned on the advice of midwives under the rules in pursuance of the Act; (3) the delegation by county councils of their powers under the Act. The Chairman of the Committee is Mr. Almeric W. Fitzroy, C.V.O., Clerk of the Council, and the members are Mrs. Charles Hobhouse; Dr. F. H. Champneys, Chairman of the Central Midwives' Board; Mr. J. S. Davy, C.B., Assistant Secretary, Local Government Board; Dr. A. H. Downes, Medical Inspector for Poor Law Purposes, Local Government Board; and Mr. John Peddar, a Principal Clerk in the Home Office.

It will not be questioned that there is at the present time a real need for a thorough inquiry into the working of the Midwives Act. The experience of the last few years has brought into prominence various important questions relating to midwives and their work that will require careful consideration, and probably amending legislation, before the full benefit of the Act can be reaped. The decision to institute an inquiry will, no doubt, be generally approved, but, unless we are much mistaken, the same approval will hardly be extended to the constitution of the committee that is to conduct the inquiry. It was natural to expect that the committee would include at least one member having practical experience of public health administration. The Midwives Act is emphatically a public health measure. The chief object its promoters had in view was the lessening of the mortality and sickness associated with childbirth; and the importance of this field for preventive effort is apparent from the fact that, in 1906, the number of women who died in England and Wales from puerperal septic diseases and other diseases of pregnancy or childbirth was no less than 3,757, equivalent to a rate of 4.02 per 1,000 births; while in the ten years immediately preceding, the average proportion was 4.48 per 1,000 births. As to the amount of non-fatal sickness associated with this mortality, Sir Wm. Sinclair

has stated that for every case of puerperal fever there are at least from five to seven cases of chronic morbidity which cause continuous suffering or prolonged or permanent disablement. The prevention of this enormous amount of preventable suffering is alone a matter of great importance, but in actual administration the scope of the Midwives Act has been extended, and in many ways it is becoming a valuable educational influence. The work of the midwife has been co-ordinated with that of the health visitor, and the Act has become a potent measure for the prevention of infant mortality. The executive officers on whom the administration of the Act devolves are the medical officers of health of the counties and the county boroughs, and the annual reports of these officers afford ample evidence of the fact that the Midwives Act is being made one of the most valuable public health measures that have been placed on the statute book.

In view of these considerations, it is difficult to see why the committee appointed to inquire into the working of the Midwives Act, should be without a single representative, central or local, of the public health service. It is true there are two representatives of the Local Government Board on the committee, but both are engaged in the Poor Law side of the Board's activities, and have nothing to do with public health administration. The committee's inquiries will no doubt embrace questions affecting the Poor Law, and it is well that experts in Poor Law administration should be represented on the committee. But the working of the Midwives Act is primarily and chiefly a public health question. The evidence placed before the committee will, we must assume, be mainly that of public health officers, yet the whole question will be officially considered and decided upon by a committee upon which the public health service is without representation.

We hope, however, that it is not too late to strengthen the committee by the addition of at least one representative of the public health service; but in any case it is most important that the public health aspect of the question should be fully and effectively placed before the committee in evidence. Medical officers of health who give evidence will do well to avoid side issues, and to keep in view the main question, which is—How can the Midwives Act be made most effective for the promotion of the public health?

THE PREVENTION OF BLINDNESS DUE TO OPHTHALMIA OF THE NEW-BORN.

By N. BISHOP HARMAN, M.A., M.B. (Cantab.),
F.R.C.S. (Eng.).

Ophthalmic Surgeon Belgrave Hospital for Children,
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Blind School.

THE body politic, or the State, has done no greater honour to the medical profession than that which it has done in placing the national health in the protection of that branch of the profession controlling the public health departments. The recognition of the fact that modern medicine aims as much at the prevention of disease as at the relief of suffering is one of the greatest tributes that has been put to the credit of our art.

In these days we are as much in earnest in improving the physical possibilities of the children, and therefore of the race, as we are in the prevention of disease, for the one conduces to the other perhaps as much as the direct attack on the sources of infection. In all directions strenuous efforts are being made to improve the chances of happy and successful life for the coming generation, and the success that attends our efforts in guiding the energies of public-spirited lay workers to a fruitful result, will measure the degree of the continuance of the confidence that has been reposed upon us by direction of the State in the many enactments that are written in the books of the law of civilised states.

Great things have been done, and yet much remains to be done. A very little acquaintance with certain of our public elementary schools will show that there are blots upon our success in the prevention of disease that should engage our earnest attention.

BLIND CHILDREN.

For the past six years, by the direction of Dr. James Kerr, Medical Officer for Education of the London County Council, I have had the oversight of the schools for the blind and partially blind which form a part of the special school system of the county. During that time I have examined over 400 children, noting the condition of their eyes, the degree of blindness, and determining by every means in my power the cause of the blindness. The conditions affecting the eyes of these children are many, but by a very little arrangement it is possible to group them so as to show how heavy is the toll of blindness arising from certain particular diseases.

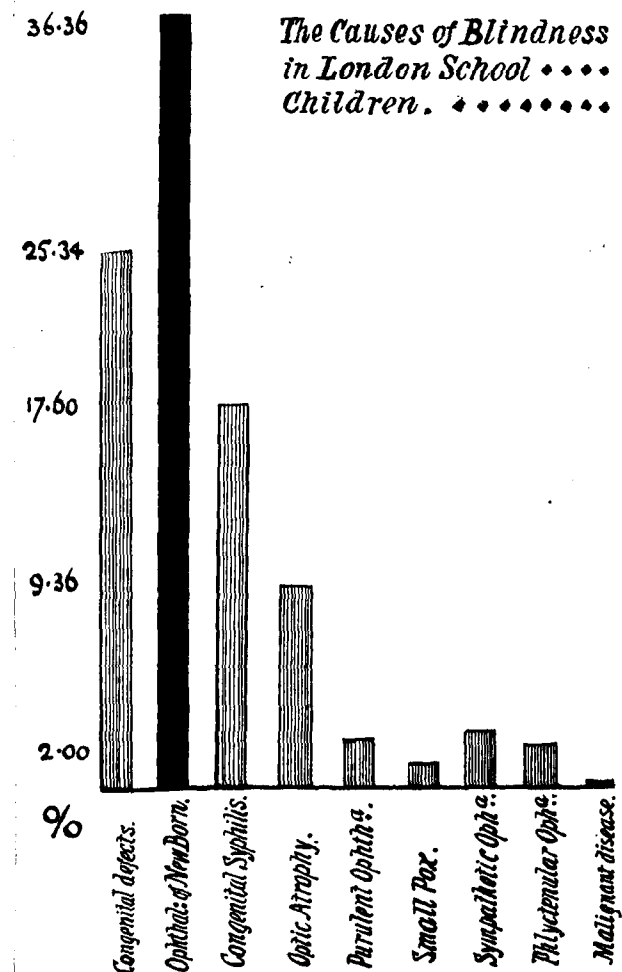


FIG. 1.

The figures which I arrived at and published recently in a little book* may be summarised as follows:—

Ophthalmia neonatorum	36.36 %
Inherited syphilis (interstitial keratitis, uveal disease, and optic atrophy)...	17.60 „
Optic atrophy, various causes	9.36 „
Macula damage	1.38 „
Retinitis pigmentosa	1.38 „
Purulent ophthalmia	2.20 „
Smallpox	0.82 „
Sympathetic ophthalmia	2.75 „
Trachoma	0.55 „
Phlyctenular keratitis	1.95 „
Congenital defects (cataract, high myopia, microphthalmia, buphthalmia, colobomata of iris and uvea, albinism, hydrocephalus, etc.)	25.34 „
Malignant disease	0.27 „
Total	100.00 „

* Preventable Blindness: An account of the disease known as the Ophthalmia of the New-Born, and of its Effects; with a plea for its suppression. By N. Bishop Harman, (Baillière, Tindall & Cox, London, Price 2/6.) The figures in this article are taken from the book.

At the head of the list is the maximum percentage produced by one form of inflammation of the conjunctiva, and one that acts for only a very short period of the life of the subject, 36·36 per cent. of the blindness is due to the effects of the ophthalmia of the new-born.

Great as this percentage is, it is in reality greater, for, by careful attention and operation, some of the cases which figure in the list under other headings have been relieved to such an extent that they will escape from the category of blind; and then, by the exigency of official arrangements, the high myopes, who are not blind, but for whom an ordinary elementary school curriculum would be injurious, are collected in these schools. If all those who, in later years, would pass as bad-sighted and not as blind were eliminated, the **percentage of blindness from ophthalmia neonatorum would exceed 40 per cent.**

The figures obtained from the London County Council schools can be paralleled by those from any other county examined. Reinhard debited Germany, Austria, Denmark and Holland with 40 per cent.; Claisse gave Paris 46 per cent.; Magnus gave Breslau 34 per cent., and Katz gave Berlin 41 per cent. as blind from this cause.

INCIDENCE OF OPHTHALMIA NEONATORUM.

To obtain some indication of the incidence of the disease amongst the population generally I have made two sets of inquiries:—

1. A London district was selected, a suburb containing a fair average of London population. The practice in the district would be known as "mixed." Half the population live in tenements, the other half in houses rented from £30 to £80 per annum, but there are few at the higher rental. At the lowest estimate, three-quarters of the children living in the district attend public elementary schools. I saw many of the doctors in private practice in this neighbourhood and inquired their experiences of purulent ophthalmia in the new-born. I have now statistics of 15,000 live births. Amongst these the incidence of the disease averaged 0·87 per cent., and the incidence of injury to the eyes of infants from the disease averaged 0·047 per cent. Roughly, it may be said that of every 100 children born one contracts the disease, and of every 2,000 born one is blinded or partly blinded by the effects of the disease.

2. As a check to this inquiry I examined the returns of the examination of the vision of children attending elementary schools in

London, and found that one child in about every 4,000 showed the effects of the disease. It must be remembered in comparing the results of these two inquiries that no allowance is made for the death of affected infants and, according to Lobenstine and Harrar of New York, children born of gonorrhœal mothers are less viable than those born of healthy mothers.

CENSUS OF THE BLIND.

In examining the census returns of England and Wales for 1901, in a population of 32,527,843 souls, as many as 25,317 were returned as blind. Of these 4,621 were returned as being blind from childhood, or one person in every 7,000. Of those blind from childhood it is of course not possible to say with certainty the cause of the blindness, but those with experience of blind schools and asylums will not hesitate to agree that the conditions found in the London schools may be applied to the whole population. This would mean that in 1901 there were living 1,000 to 2,000 persons who were blind from purulent ophthalmia occurring at birth, and whose blindness might have been prevented.

For a moment I might call attention to the seriousness of the loss which this means to the community. Let sentiment alone, and neglect the thought of the deprivation for so many of the chiefest joy of sense, and the greatest aid to freedom, usefulness, and pleasure! Consider only the cost of these damaged folk to the community. Mr. Foulerton, the Medical Officer of Health for Surrey, in reviewing my book, wrote:—"It may be pointed out that accepting Mr. Harman's lowest estimate of 1,000 of the population blind from this cause, the cost of their maintenance must amount to over £50,000 per annum (the actual amount is probably nearly twice that sum), apart from the loss to the State of the services of so many workers." When we look into the accounts of the costs of providing education for the children in the elementary schools, and compare the cost of the normal child with that of the blind child, we are not surprised at Mr. Foulerton's estimate.

THREE CLINICAL POINTS.

I do not propose, in this place, to discuss the clinical aspect of the disease; only on three points will it be worth while to revert to certain clinical features:—

1. What is the cause, or most frequent

cause, of the condition usually known as Ophthalmia Neonatorum? It is quite easy for any one with a rudimentary knowledge of bacteriology to satisfy himself of the commoner infections that underlie the purulent discharges of infants. For all practical purposes the microscopical examination of suitably stained film preparations of the pus form a sufficient diagnosis. And the conditions of staining are: that one be treated with an aniline dye, such as Loeffler's Methylene blue, and the other by the useful Gram's selective process.

A careful examination of large numbers of cases of purulent discharge in the new-born, has shown that 80 per cent. are due to inoculation of the eyes at or about the time of delivery with the gonorrhœal virus, the micrococcus of Neisser; and these are the cases that are dangerous to sight, for they produce the severest and most destructive form of inflammation, and consequently endanger the integrity of the cornea. The remaining 20 per cent. are cases of milder order, and are due to accidental inoculation with the Koch-Weeks bacillus, the colon bacillus, or the pneumococcus. As I have said, film preparations form a sufficiently accurate means of detecting these organisms in discharges from the conjunctiva.

2. Is the disease a danger to the members of the community other than the infants affected? It is necessary to estimate the risk which these cases present to the community at large, for our view of the possible bearing of certain legislative enactments will be influenced thereby. It would be possible to cite instances, and not rare instances, of attendants of these children, who have contracted the disease from their charges, and whose sight has been seriously damaged thereby; but these cases are not talked of too much—they have a tragic side. Let me cite by way of evidence the following:—On one day at Moorfields Hospital, I saw a mother and three girls, aged ten, eight, and four years, and an infant of four weeks. The baby had developed ophthalmia neonatorum on the fourth day of life; a week later the youngest girl contracted the disease; a few days later the second caught it, and subsequently the eldest girl; and at the time they were seen the four children had the disease, and the mother showed the initial symptoms of an attack. Further, it was found that each of

the children suffered from a gonorrhœal vulvitis. Such a series of secondary infections demonstrates more forcibly than any argument the risk of such a disease to the community at large.

3. What class of the population are most affected by the disease? I can best answer this by giving my experience at the Belgrave Hospital. For many years it was situated in Pimlico, and tended a small but very poor district. Amongst the infants under the age of twelve months 34·4 per cent. were suffering from the ophthalmia of the new-born. In the new hospital at Kennington, the patients are more numerous, and on the average better kept; of the infants under the age of twelve months that have attended here, only 6·2 per cent. were the subject of the disease. It is evident from these figures poverty and neglect tend to increase the liability to the disease.

PREVENTION OF DISEASE.

Long before the microbic origin, and the essential contagiousness of the disease has been determined, some sage observers came to conclusions as to its nature, and the precautions to be taken for its prevention, that cannot be bettered to-day.

To Gibson, of Manchester, belongs the credit of first pointing out what should be done to stay the ravages of the disease. He wrote, in 1807, giving three directions:—

1. The leucorrhœa of the mother ought, if possible, to be cured during pregnancy.

2. When this has not been done, the noxious secretion ought to be removed from the vagina during delivery.

3. The infant's eyes ought, immediately after birth, to be cleansed with a fluid which either removes the noxious matter, or is able to prevent its injurious effects.

No directions could be better; unfortunately many would not believe in the true contagiousness of the disease. Stellwag writing in 1860, recommends for the prevention of the disease, "to keep the child away as far as possible from all dazzling light." Cleanliness is of little count in his mind, and he repudiates the idea of inoculation from maternal discharges. The discovery by Neisser of the organism responsible for the most serious form of the disease justified Gibson and his preventive methods, and thence forward there came a general introduction of regular practices of cleansing the passages of the mother and the eyes of the child.

The name of Credé is particularly associated with the modern practice of prophylaxis. In his earliest publication he lays stress on the necessity for the disinfection of the vagina, and the subsequent cleansing of the eyes of the child with an antiseptic solution. Gradually attention became focussed on the child's eyes. That the organism in question could be easily destroyed was shown by Piringer. He found that pus from an acute case of the disease might be inoculated into the conjunctival sac without injury, provided it was well washed out with water not later than three minutes after the inoculation.

Credé ultimately recommended the instillation of a 2 per cent. solution of silver nitrate into the eyes of the child immediately after birth. The benefit of the measure as applied in certain lying-in institutions is beyond doubt. In Credé's clinic in Leipzig, prior to the use of this prophylaxis, the average incidence of the disease was 10.8 per cent.; after its use the incidence fell to between 0.1 and 0.2 per cent. And under similar conditions as good results have been obtained elsewhere.

Such results as these are very striking, and it is no wonder they have elicited much enthusiasm from those who know how much of the blindness found in our asylums is due to this one disease.

From the recognition of the boon such a method may be under certain conditions, it is but a short step to the supposition that it would be of equal value were it carried out under all conditions. Accordingly, it has been proposed that the method of Credé should be made compulsory by law—that is, that the eyes of every child should be treated with silver drops as soon as it has been born.

Such a proposition as this could not be made without exciting discussion, and there has been plenty of it both at medical society meetings and in the medical press.

To sustain an argument for compulsory prophylaxis two points must be made:—

1. That there is a general or fairly general liability to the disease.
2. That the prophylaxis is a certain preventive of the disease.

The first proposition is absurd. It can only be held by men who work so long at certain classes of disease that they become obsessed by the disease, and then believe all contaminated thereby. But the disease is not like smallpox to which all unprotected are liable,

be they clean or dirty, moral or immoral; it has, at least for 80 per cent. of the cases, a basis which proves a breach against the ordinary canons of morality held by the community. To brand the whole community because of a relatively few sinners would be as absurd as to damn with faint praise the pleasant lake of Windermere because we find on a part of its leeward shore a filthy scum of froth and rotting weed and stinking fish!

But let us take a few figures. Of the 15,000 London births, of which I obtained information privately, 12,000 were delivered by doctors who used no other prophylaxis than scrupulous cleanliness, and left silver or mercury solutions for the suspect cases; the incidence of the disease amongst these children was 0.72 per cent., and the injury rate 0.04 per cent. This compares very favourably with the best Leipzig results when Credé's method is practised.

As to the second proposition, the efficacy of the prophylaxis, we may admit that the use of silver nitrate drops of 2 per cent. is effective in cases where they are properly employed. But the usage may occasionally do direct injury to eyes, and again it may only cover slovenly practice.

There is a distinct body of evidence to show that the use of the silver solution, or for that matter, any germicide of sufficiently powerful effect, is not always innocuous to infants. Any such re-agent by its very nature is an irritant, and is liable to produce a transitory inflammation of the conjunctiva; this is a small matter when the effects are watched by skilled observers, but it would not be so if the usage became so prevalent that it was placed in the hands of untrained or partially trained midwives; they would be likely to mistake the "silver catarrh," as it is called, for an initial sign of ophthalmia neonatorum, and probably increase the mischief by a further use of the germicide. I have seen this done, and with serious effect in weakly and ill-developed children.

Of the 15,000 private cases I have referred to, 3,000 were treated by the full Credé method, yet there were 1.2 per cent. of mild purulent cases and 0.1 per cent. of severe purulent cases, and in two cases or 0.06 per cent. eyes were blinded. The figures for these 3,000 cases are not so good as were those of the other 12,000 of the same district where there was no routine use of germicides.

From these observations we may conclude

that Credé's method has done wonders in reducing the incidence of ophthalmia neonatorum in lying-in institutions, but it has not extinguished the ophthalmia, though the method is applied by experts and the infants are under complete control. Further, special routine methods may be necessary in hospitals where there is a cumulation of sources of infection. The experience of private practitioners, men who have carefully tried both methods, shows they prefer strict cleanliness to a routine use of a germicide, and the use of the germicide in suspicious cases only; and in this they are following the dictate of rational medicine, and also the lines of prophylaxis first suggested by Gibson.

At this point I might outline a course of procedure for those who like rules.

1. Directly the head of the infant is born, wipe the eyes dry with clean dry cotton wool.

2. As soon as the mother is settled, wash the eyelids of the infant freely with a simple lotion, then part the lids and run plenty of the clean fluid between them. For midwives' Condy's fluid is best, for the colour is impressive. The water used in the first bath of the child must not get into the child's eyes. At no time during the lying-in period may the mother's sponges, napkins, etc., be used for the child.

3. If, at delivery, there be a suspicion of a purulent discharge from the vagina of the mother, cleanse the eyes in the same way, and wash thoroughly, then instil a drop of silver nitrate, 2 per cent., between the lids. The eyes must be re-examined and washed at the end of eight hours and, if there be any suspicion of discharge, instil silver nitrate of 1 per cent., and no stronger, once in twelve hours, and wash with Condy every three hours. I lay as much stress on the washing as on the use of the germicide.

Recently an experienced lady doctor, a supervisor of midwives, asked me how I defined a "suspicious discharge" in infants, seeing that in most pledgets of mucus appear at the inner canthus by the end of the first twenty-four hours. My answer was to quote the words of the memorial to the President of the Local Government Board in 1884—"If the child's eyelids become red and swollen, or begin to run with matter. . . ."

NOTIFICATION.

It is not enough to leave the matter here. Our present methods, even with the

aid of the Notification of Births Act, do not give us effective control over the disease. It is still appallingly common to get children brought to the eye hospitals with the eyes irretrievably damaged within the first month of life.

Compulsory notification of all cases has been suggested as the best means of controlling the disease. The idea is an excellent one. This manner of attacking a disease is not new and unfamiliar; it has the advantage of custom and use. Some diseases must be notified at all times; others are added or removed from the list as occasion and epidemics suggest. The Infectious Disease (Notification) Act of 1889 has worked with conspicuous success in the case of those diseases scheduled under the Act, but the ophthalmia of the new-born is not amongst them.

Notification of a disease is one of the first requisites to our knowing what is the true incidence of the disease. The tale of its effects we may know, but the number of cases from which these arise we do not know. So those who look to the compulsory use of a germicide must urge the necessity for notification as a preliminary to their demands.

I can best illustrate the advantages to be derived from notification by the following:—

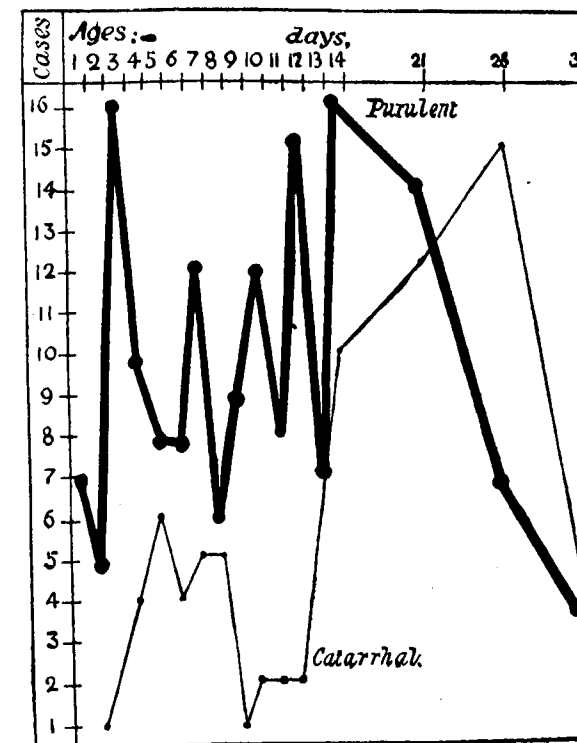


Fig. 2.—The incidence of Purulent and Catarrhal Conjunctivitis in infants under five weeks (Middlesex Hospital.) Nearly all cases of ophthalmia of the new-born (purulent) commence within the first week of life. The chart shows that many more than half were not brought to hospital until the second week or later. It was amongst those who were not brought until a late stage of the disease that almost all of the damaged or blinded eyes occurred. Compulsory notification of the disease would secure the prevention of these disasters.

In a series of sixty cases of ophthalmia neonatorum twenty-two were first seen by me three or more weeks after the onset of the disease, of these, eighteen came with one or both eyes permanently damaged. The other thirty-eight cases were seen in the first week of the disease, only one suffered any permanent injury to the eyes, and in this instance the parents lived twenty miles from the hospital and failed to bring the child for attention. The moral is clear—get the cases early, and treatment will be a brilliant success. This is why we desire compulsory notification.

Notification is not only a controlling measure, it is of the highest educative value to the general public. It brings home to those most interested the seriousness which is attached to the disease by the authorities, and it is an infinitely preferable mode of education to such wild-cat schemes as that proposed by Fienzal, of Havre, that a booklet with warnings of the dangers of the disease should be given to those registered as just married; or the even more appalling proposition of Cohn, that the dangers of the disease should be explained to children in schools!

There are two objections to notification that I may deal with here:—

1. That the disease is essentially venereal, and that notification of the occurrence of the disease would be a hint of the "C. D. Acts." This objection disappears entirely when we remember that 20 per cent. of the cases of purulent conjunctivitis in the newborn are due to organisms other than the gonococcus. It is true that this is the most frequent and most dangerous cause of the disease, but there are others.

2. The Infectious Disease (Notification) Act was drawn up, it is sometimes said, with the intent of protecting the public and not to secure for the sufferers prompt treatment. The history of the family I have given, where the disease of the baby was communicated to the three elder girls and then to the mother, and ultimately produced a vulvitis in all the girls is sufficient answer to that objection. The disease is essentially contagious and is a danger to the community. It may not kill, but it certainly ruins lives.

SUGGESTED SCHEME.

Happily no fresh legislation is necessary to make ophthalmia neonatorum a disease which must be notified. Under the powers of the Act of 1889, every local authority is enabled to add to the list of diseases the

occurrence of which must be notified to it, subject to the consent of the Local Government Board. This power has been fully used, and is increasingly taken advantage of.

The next concern is the machinery available for the treatment and oversight of the cases that may be notified. Here the difficulty is great owing to the overlapping and lack of co-ordination of the many health authorities. The medical officer of health of a district may not treat cases himself, but if he cannot do it directly, he can influence it indirectly. He can require the certification by a medical man that the case is being so treated as will prevent its being a danger to the community; and failing that assurance, he could probably deal with the case as he would with a case of infectious fever—require the removal of the patient to a proper hospital or infirmary.

In the Midwives Act of 1902, we have already control in theory over a large number of those who conduct confinements and as time goes on this control will be more effectual; but so far the arrangements do not permit of the oversight of cases occurring in their practice.

Briefly we should aim at—

1. An exercise of the powers of the local sanitary authorities under the Infectious Disease (Notification) Act of 1889, to proclaim all cases of purulent ophthalmia occurring in children within twenty-one days of birth notifiable by the attendant in whose knowledge they come, under penalties provided in the Act.

2. The arrangement of such a plan as will enable the case to be promptly diagnosed by a medical officer skilled in the bacteriology of the disease. Also to enable the case to be promptly and efficiently treated, either by a private doctor, or by a doctor or doctors deputed by the Midwives Supervision Boards, or by a public hospital; or failing these, to provide for the removal of the child to a poor law infirmary or such other convenient place as may be arranged, the mothers being provided for within the hospital for such time as necessary.

3. That the results of all such cases on the cessation of the disease should be notified to the medical officer of health for the district, for return to the Local Government Board, and subsequent publication with the returns of infectious diseases.

I believe the working out of such a scheme

SOME FIGURES FROM MEDICAL INSPECTION.*

By REGINALD GREEN, M.D., D.Hy., D.P.H.,
Medical Officer of Health, King's Norton.

as this would result in the almost total extinction of blindness due to purulent ophthalmia at birth, both by ensuring the prompt and efficient treatment of all cases of the disease, and also by educating the public to a sense of the seriousness of the disease and their own responsibility in the matter.

CONCLUSION.

In conclusion, I would urge the necessity for speedy action in this matter. With the extension of the Employers' Liability Acts, it will be increasingly difficult for the physically defective to obtain employment. Contracting out by the employers is not permitted, and the risks of employers are proportionately increased when a workman suffers so grave a physical defect as that of blindness. The scope of useful and remunerative manual work for the blind of ordinary ability is not wide, and there is difficulty even now in meeting the need satisfactorily. With the risks of employers' liability pressing so heavily, the prospect of employment being found from philanthropic motives will steadily diminish, so that in some way or other the burden of support of the blind will fall on the State, either by the necessity for the provision of special workshops for them, or else by their drifting destitute and helpless on the poor relief funds. Public opinion would scarcely tolerate this latter condition; if the State by the extension of the employers' liability hinders the continuance of philanthropic effort which has been so successful in the past, the State will be compelled to take up the burden it has made impossible for private effort.

With such a prospect in view, it is indeed necessary for the State, if only from mere pecuniary motives, to do all in its power to prevent the occurrence of blindness which is preventable.

PROPOSED MEMORIAL TO THE LATE DR. GROVES.—A movement, emanating from a suggestion made by Sir Barrington Simeon, just prior to his recent departure to Egypt, is being made in the Isle of Wight, with the object of providing a county public memorial of the late Dr. J. Groves, J.P., who was for many years medical officer of the rural district of the Isle of Wight, and was actively associated with various public institutions in the island—philanthropic, literary, sporting and horticultural. Dr. Groves was President of the Society of Medical Officers of Health during session, 1903-04. It has been decided to open a public subscription list to provide a fitting memorial.

It is with some diffidence that I address you as President of the Midland Branch of the Society of Medical Officers of Health. This is not lessened by the consideration of the galaxy of talent that has preceded me in this responsible position. In fact, one is rather apt to feel in the position of that useful sanitary conveyance which is popularly supposed to succeed the Lord Mayor's Show. However, regarding this position as a sort of good attendance prize, it is necessary to make the best of things, and I therefore selected a subject which, however poorly it might be dealt with, was of great interest to us all, and nothing, if not quite up to date.

The great interest of our branch in this question was demonstrated on several occasions during last session, when some of the best attendances on record took place.

The Education Act of 1907 brought forth many knotty problems for our members to discuss, and the advantages of these discussions to us all, I am sure, were very great.

The issue of Circular 576 by the Board of Education was a great day for the Medical Officer of Health, and it might with truth be entitled "his charter," in the same way that a certain sanitary epigrammist styled the Act "the children's charter."

Whether the issue of Circular 596 has modified our "magna charta" or not to any extent, remains to be seen, but it strikes me, as a possible symptom of the proverbially British "spirit of compromise," this last circular is possibly the resultant of the two forces, which might be termed the dualist and the monoist forces.

One force, the latter, wishing for a separate department for school hygiene medical inspection, far removed from the baneful influence of the Health Office and its associations; the former wishing to unify, in the words of Circular 576, all the work connected with the health of a district, including the physical well-being of its juvenile population.

*Presidential Address to the Midland Branch of the Society of Medical Officers of Health on November 5th, 1908.

My authority has always been fully alive to the great advantages of medical inspection of school children, and four years ago I was appointed medical adviser to the education committee.

Three years ago the committee tried to carry through a proposal to appoint a school medical officer to devote his whole time to the work, but this was considered premature by the council, who threw out the proposal.

When the Education Act (1907) was passed and Circular 576 issued, the council very soon appointed a lady medical officer to carry out medical inspection and other specified duties under the supervision of the medical officer of health. They were fortunate in obtaining the services of a highly qualified lady, who has already done excellent service for the committee, and the result of whose inspections will be dealt with in this address.

During the school year of 1905-6, I conducted a series of eye tests with Snellen's Type in the schools of my district. First a demonstration was given to all the head teachers, who then tested the eyes of all the children in their schools, each eye being done separately. All the scholars who failed to see $\frac{1}{2}$ or $\frac{1}{3}$ with either eye were afterwards examined by me.

As a rule the results obtained by the teachers were fairly correct, but there is little doubt but that there is a great variability in the vision of persons when examined at different times. This is connected, apparently, with the state of general health, and also with the amount of use the eyes have had just before being tested. Of 7,214 children in all tested, 1,140 were defective, at least in one eye, this being 16 per cent. of the whole. There were 3,572 boys and 3,642 girls examined; of the former, 526 were abnormal, and of the latter 614. The boys, therefore, were defective to the extent of 16 per cent., the girls to 17 per cent. There were 1,174 infants tested with 215 or 18 per cent. defective. The testing in this way of the eyes of children under seven years of age is unsatisfactory, and only the older ones were examined.

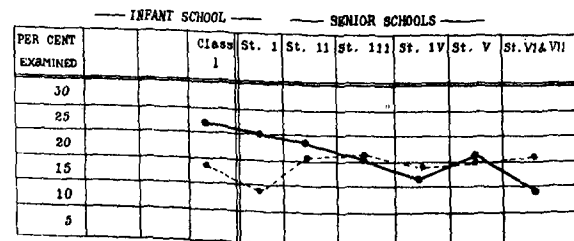
On Chart A is shown the percentages of optically defective children in the different standards of all the schools. This chart shows that the children in the higher standards have as good or better sight than those in the lower ones, which is contrary to what one would expect. The vision of the country children

was, as is generally understood, somewhat better than that of the town dwellers, the defective cases being only 14 per cent.

CHART A.

Eye tests with Snellen's type.

Defective vision in the different standards.



Girls ———
Boys - - - - -

There were 482 scholars who could see $\frac{1}{2}$ of the normal, 303 who could see $\frac{1}{3}$, 173 who could see $\frac{2}{6}$, 84 who could see $\frac{3}{6}$, and 100 who could only see $\frac{4}{6}$. In each of these classes it is seen that the girls predominate.

The difficulty of remedying defects found is greater even than that of discovering them.

A considerable time after these inspections had been completed, and after notices had been sent out to the parents from the Education Office, only 11 per cent. of the defective children had obtained spectacles. Where the provision of glasses has to be left to ordinary charity, one finds that hospital notes are soon exhausted in poor localities, and that all other sources of supply soon run dry.

The infectious disease history of our school population is of the greatest interest to all practical sanitary administrators, and is not one of the least of the benefits of medical inspection.

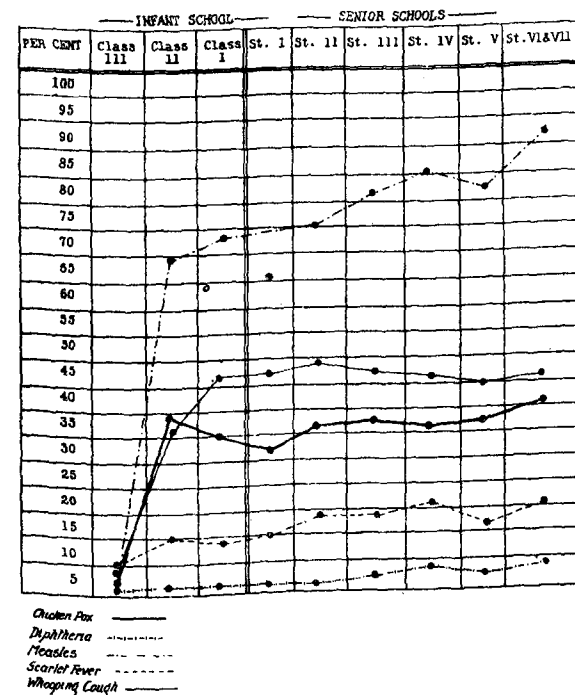
The question of school infectious disease, for example, is much simplified by such knowledge, and many of us would now, at any rate, hesitate to close a senior school for a disease like measles or whooping cough. In my district the infectious disease history of the school children has recently been recorded to the number of 10,675.

Of this total 5,408 were boys, 5,267 girls, 3,661 of these being in the infant schools.

On Chart B is shown the percentages of children who have had the five most usual infectious diseases. These are given in classes and standards, starting from the babies in the infant department up to Standard VI. and VII. of the senior school.

CHART B.

Incidence of Infectious Diseases in the standards.



The chart suggests that measles, whooping cough and chicken pox, are nearly all acquired in the infant department.

It must be remarked, however, that the measles curve shows a fair rise during senior school life. Scarlet fever, and more especially diphtheria, shows a gentle rise all through school life, but they are both present to a much less degree than the minor zymotics.

It seems a moot point whether this is due to the lesser infectivity of the latter two diseases, or whether the greater attention that has been paid to isolation, notification, and disinfection in their case, is concerned materially in this result. Now as to the proportion of boys, girls, and infants who have had the specified diseases. Thirteen per cent. of the girls, 12 per cent. of the boys, 8 per cent. of the infants, had had scarlet fever. The incidence of diphtheria was about the same in the three classes.

Measles (probably including Röteln), had attacked 75 per cent. of the girls, 72 per cent. of the boys, and 63 per cent. of the infants.

Whooping cough had affected 46 per cent. of girls, 41 per cent. of infants, and only 36 per cent. of the senior boys. There were 34 per cent. of girls, and 29 per cent. of both boys and infants, who had had chicken pox.

The large proportion of infants attacked may be partly accounted for by the increasing urbanisation of the district, with its necessary corollary of a greater amount of infectious diseases.

These optimists, and they do exist, who expect that any system of medical inspection will finally abolish zymotic disease from our schools, are doomed to disappointment at any time this side of the millenium.

Of the country children, 10 per cent. had had scarlet fever, compared with 17 amongst town scholars; 2 per cent. diphtheria as to 3 per cent.; 61 per cent. measles as to 85 per cent.; 29 per cent. whooping cough as to 45 per cent.; and 25 per cent. chicken pox, as to 36 per cent. amongst town dwellers.

The cause of this smaller incidence of infection amongst dwellers in the country, is no doubt less inter-communication, and increased resistance, owing to better atmospheric conditions. These returns of infectious diseases must be taken with a certain amount of caution, as the diagnosis, must, in a large number of cases, have been made by the mother, assisted by a deputation of neighbours, the majority of whom were graduating for their old age pensions.

It is from this source probably that come these numerous cases, not mentioned in the text books, of children who have had measles five times.

The prevalence of ringworm in our schools has assumed greater importance since medical inspection has come into being in this country. The comparative failure of ordinary home treatment, and the suggested substitution of X Ray treatment for ringworm, are subjects of much discussion at the present time. There seems little doubt but that, when the fungus has once penetrated to the deeper layers of the scalp, the application of iodine, or similar substances, is of little avail.

In all advanced cases, or preferably in early cases, if a rapid cure is desired, the X-Ray form of treatment is *facile princeps*.

This treatment being under consideration, a return has been procured from the schools in my district, showing the number of cases during last school year, together with the number of attendances lost, owing to the disease.

From this return it appears that 215 children had been attacked by ringworm during the year, or 2 per cent. of the whole number.

There were 125 infants affected, that is, 50 per cent. more of them than of the older scholars.

In one infant department twenty-four children were infected, whilst in four others, twenty-one, nineteen, fifteen and fourteen scholars respectively, took the complaint.

There were lost 11,442 attendances, equal to 1,144 school weeks.

The greater incidence of the ailment amongst the infant scholars raises the questions of immunity being produced by an attack, and also that of special age predisposition.

The average time lost by each case was 5.3 school weeks, and varied from thirteen weeks in one girls' department to two or three weeks in several other instances. In the latter cases it is very probable that the patients returned to school whilst still in a contagious condition, and it is essential that a microscopic examination should be made of the roots of the hair stumps in all these cases. If spores are found, no child should be allowed to attend school. These examinations are now being made in my district, and numerous cases, certified as clear clinically, have been found to be still infectious.

Since May of this year, organized medical inspection has been carried out in my district, and, up to the present, over 3,000 children have been examined. The time taken to examine one scholar has averaged about ten minutes, excluding eye and ear testing, and weighing and measuring.

Dr. Helena Jones has furnished me with particulars of 2,906 examinations of scholars, all of them being either infants or girls about the age of thirteen years.

There were 572, or 19.6 per cent. of children with verminous heads, which, although a large proportion, is lower than has been found in the district on former occasions. This reduction is largely due to the work done by the health visitor, who, for some years past, has examined large numbers of children in school, and paid innumerable visits to their homes.

Cards and handbills of instruction as to cleansing heads have been issued throughout the district, both for the health department and for the education office. This year, in addition, sassafras oil has been supplied free to poor people for head cleansing.

The teeth of the school population of this and other countries are in a very unsatisfac-

tory state. It was found that 2,075 children, or 71.3 per cent. of the whole, had defective teeth and required the attentions of the dentist.

From my experience of older boys, there are practically none with really good teeth, and it is generally found that girls' teeth are worse than those of boys.

The use of tooth brushes is now becoming more common among the elementary scholars, and the majority of the children that I examined said that they possessed them.

The times at which they used them varied considerably, but an average of once or twice a week was usual. The reason given by one boy for not being able to brush his teeth because he was taking music lessons, was quite unique. The well-known cocoa firm, whose works are situated in my district, and whose members are noted philanthropists, have had for some years under consideration the teeth of their employes, who are mostly girls.

Owing to the deplorable condition of the teeth of many of the applicants for employment, they have now provided tooth brushes and powder for the use of the scholars in several of the largest schools of the district, from which the bulk of the girls are drawn.

Previous to doing this they had a conference with the head teachers of the district, with the object of organizing tooth-brush drill in the schools, but this was considered impracticable by the teachers and had to be abandoned in favour of home use.

The good effect of this provision has been noticed already, during the examinations made in these schools.

No less than 836 children, or 28.7 per cent., were found with enlarged tonsils, and 760, or 26.1 per cent. with presumable adenoids. The proportion of these growths varied in different parts of the district, and seemed most numerous where the soil was clay and favourable to the retention of moisture. The medical treatment of these conditions, which is so necessary, is a matter of difficulty at present, as the hospitals are quite unable to do it, owing to the large number of cases that present themselves.

There were found 1,670 children with enlarged glands, many of them associated with enlarged tonsils. External eye diseases were present in 217 children, or 7.4 per cent., and ear discharge in 48.

There were 299 instances of lateral curvature,

SOME POINTS IN INDUSTRIAL HYGIENE.*

By W. M. HAMILTON, M.D., M.Ch., D.P.H., J.P.,
Medical Officer of Health, Eccles.

IN choosing a subject for a Presidential address to a learned society such as this, the majority of whose members are, to use a vulgarism, "better up" than I am, a very great difficulty is presented. Some time ago I was struck by a dictum of a past president of this branch, and one whom I am proud to call a friend—Dr. Wheatley. He said a man should only read a paper on a subject on which he had been working.

Bearing this in mind when casting around for a subject, it struck me that, as a factory surgeon of many years standing, and one who has taken a great interest in the conditions of factory life, as they affect the individual of the present and subsequent generations, that I might with interest give you a short paper on this subject.

The broad principle that it is the right and duty of the State to restrict the freedom of the individual in the interests of the community is recognised by all but a small minority, who hold that all State interference is inexpedient in industrial matters, as it fetters free development under which things tend to right themselves by stress of competition. This is called "Manchesterism." It is unfortunate that this great city in which we meet—a city which has established a new school of political economy—should have its name applied to what is essentially a doctrine of anarchy.

The beginning of factory legislation was in 1802, when the "Health and Morals of Apprentices Act" was passed limiting the hours of working to twelve, and doing away with night work. Many years later comes the general protection of children, and limitation of their hours of work. Next comes the legislation for the protection of women—the fencing of machinery. Then the question of dangerous trades was brought forward and special rules passed regulating these trades. Then followed general measures affecting health, ventilation, humidity, air space, closet accommodation, etc.

This is briefly the history of our factory legislation. That it has tended to the well-being and health of a large section of the community—and anything which does this benefits the whole population—cannot be denied.

equal to 10.2 per cent., many of which were of slight degree, and no doubt caused by faulty positions of sitting.

Diseases of the lungs was detected in 107 children, and 124 cases of heart disease were found.

I am unable to claim any great amount of novelty for the figures presented to your notice, but hope that some of them may have been of some slight interest. Figures are naturally wearisome when read out in rows, and I must thank you for your great patience in sitting out this peroration.

THE HOUSING QUESTION IN RURAL DISTRICTS.—So far as the Rural Districts of the County are concerned, the problem that has to be faced is that whilst many of the houses are old and worn out, and often overcrowded, there is little building to take their place. Under these circumstances, effective action by the medical officer of health is extremely difficult, but notwithstanding the difficulties in the way of effecting reform, and the fact that closing houses may temporarily, at least, aggravate the bad conditions of housing, it is his duty under the Housing of the Working Classes Act, 1890, to make a representation to his council with regard to any house that in his opinion is unfit for habitation. The responsibility is then thrown upon the sanitary authority. Where housing accommodation is unsatisfactory and where private enterprise is not sufficient to provide an adequate supply of new houses, there are only two courses open (1) for the sanitary authority to build houses under Part III. of the Housing of the Working Classes Act, 1890; (2) for the sanitary authority to cause the existing houses to be maintained in the highest possible state of efficiency. This can only be done by a frequent and thorough house to house inspection followed up by action wherever necessary. The enormous importance of this inspection as a conservative agency has not been sufficiently realised, and also the fact that without it rate-aid for the building of houses will become much more urgent. A sanitary authority may either proceed by closing houses as they become unfit for habitation, and trust to the increased demand creating an increased supply, or they may provide for those, who are displaced, by building houses. The first method no doubt for a time creates hardships and perhaps increases overcrowding. It is certainly impossible, without considerable monetary loss, to build new houses for the tenants displaced from slum property. The houses have to be built for a class somewhat higher in the social scale in the hope that there will be a general movement upwards.—*Annual Report of Dr. James Wheatley, County Medical Officer of Health, Shropshire.*

* Presidential Address delivered to the North-Western Branch of the Society of Medical Officers of Health on October 16th 1908.

What it has done is to abolish the evils of child labour, in the hovels and cellars of the home-stead when the conditions of life were infinitely worse than in any factory, and to bring their conditions of life and labour into the light and place them under inspection. As a rule, commercial interests have opposed the measures urged by humanitarian thought, and, in many cases, have succeeded in modifying them; but the public, with whom the ultimate decision has rested, has recognised that anything which tends to the well-being of a large section of the community must benefit the whole State. The conditions under which work is carried out have been revolutionized; yet it is singular that after eighty years of progressive improvement in the direction of health, the question of physical deterioration among the industrial population should be to-day the burning question. There is no doubt that good conditions of working promote good work, and to their credit, be it said, many employers have acted on this principle by voluntarily shortening the hours of labour and by other measures for lightening the toil and increasing the comfort of the workers. The problem would be very much simpler were each competing nation placed under the same industrial conditions. As international competition grows keener, the effect of unequal conditions is more marked, and unequal factory laws mean commercial success or failure.

The subject is too extensive to be dealt with in the short address I have promised. I shall therefore omit all details of the factory laws as regards children, young persons, and women, as I know that every member of the Society is conversant with them, and epitomise the regulations safeguarding health:—

- (1) Every factory must be kept in a cleanly state.
- (2) It must be kept free from effluvia arising from any drain, water-closet, privy, urinal, or other nuisance.
- (3) It must not be so overcrowded while work is carried on therein as to be dangerous or injurious to the health of the persons employed.
- (4) It must be ventilated in such a manner as to render harmless all the gases, vapours, dust, or other impurities generated in the course of the manufacturing process that may be injurious to health.

These regulations are carried out by specific rules which are sometimes observed, but more frequently neglected. The duty of seeing to the carrying out of these regulations devolves on the factory inspectors. For over one quarter of a million factories there are 158 inspectors. Out of this small number there are six superintendents with general functions, one for dangerous trades, two for medical (Dr. Legge), one engineering, one electrical, one for humid textile fabrics, and eight lady inspectors. It is thus apparent that the department is very much under-staffed, and that systematic inspection is quite impossible. As far as lies in their power the work is well done.

We have, during the last quinquennium, been told that the Germans are beating us in trade and commerce, and at present the struggle for Naval supremacy is very acute.

It will be interesting to contrast the German factory laws with ours in relation to health. The regulations in regard to age standards for employment are practically the same as in England, except that the age limit is one year later in Germany than in England. The number of children under fourteen is much greater in England than in Germany. This is an advantage to the employers, by giving the children skill in manual manipulation at an early age, and may be held to be the explanation of the undoubted superior skill of the English operative; but is the superior skill thus obtained compensated by the consequent physical degeneration it entails? We cannot shut our eyes to the fact that the deprivation of light and sun at this early age brings its nemesis in stunted growth, premature births, and the hundred and one consequences of industrial employment with which we are all familiar. Still, we in England are ahead of Germany in our regulations for the protection of children and young persons. The examination for fitness is more stringent; the age of protection is eighteen as against sixteen; the hours are shorter; the legal day begins half an hour later and ends half an hour earlier. The hours for women are ten instead of eleven. The half holiday on Saturday is a very useful and important institution. The regulations for women and young persons in dangerous trades are much more stringent in England than in Germany.

The regulations in force for all employes in dangerous trades are very full, and constitute

quite a formidable volume. They have been very carefully thought out, and are the result of many years experience.

In 1907, there were 191,184 examinations as compared with 177,885 in the previous year; much of this increase is due to the scheduling of paints and colours, and the heading of yarn. There were 890 suspensions, of which 664 were ended by further certificates. Twenty-six deaths from plumbism occurred during 1907.

Persons employed in these trades must be examined by the certifying surgeon before starting work, and must be examined once in each calendar month. The certifying surgeon may at any time, if he thinks he or she is affected by plumbism, order the suspension of any person from work, and no person shall after such suspension be allowed to resume work without a certificate from the certifying surgeon. Further, no person who has been absent from work through illness shall be re-employed without a medical certificate that he or she had recovered.

It will thus be seen that a large amount of protection is given to the workers in the dangerous trades. Under my charge there is a large works engaged in the enamelling of iron plates.

Up to a few years ago, the recognised opinion was that the *sine qua non* of lead poisoning was the blue line on the gums, and in advanced stages the drop wrist. As the result of many examinations, I pointed out to Dr. Legge, the chief medical inspector for dangerous trades, that anaemia was often present before any of the scheduled symptoms of plumbism appeared. As a result, anaemia has been added to the list of symptoms. I may state that I have suspended several girls for this reason alone, and found that after fourteen days to three weeks' suspension, they have been in a fit state to resume their employment.

It is unnecessary to give you in detail the special rules for these employments; they are doubtless familiar to you all; suffice it to say they are excellent, and have had admirable results. There is no such provision in the Germany factory laws. Still, in some other points, the Germans are ahead of us in their factory legislation; they impose more stringent regulations as regards confinements, and they insist on attendance at continuation schools. I am strongly of opinion that no woman

should be allowed in a factory for six months before her confinement, nor for six months afterwards. There is no doubt that this would reduce our infantile mortality, and thus reduce one of the greatest blots on our twentieth century civilization.

The greatest obstacle to such an obvious improvement in the conditions of pre and post-natal welfare is the *auri sacra fames*, the desire to obtain an augmentation of the family income, irrespective of the injury done to the unborn child and the necessary neglect of the newly-born infant.

You may expel nature with a pitchfork, but she will return in the dwarfed, rickety, undersized and physical degenerate of the second and third generation.

In making a comparison between factory laws in this country and in Germany, one cannot but be struck by some remarkable differences. Germany is pre-eminently the country of the "Martinet." I speak from experience; the people are policed and dragooned to an extent that would not be tolerated here. Stricter rules are laid down for the regulation of public and private life; the system of registration, to give one instance, would be found most irksome here; yet, except on one or two points, the factory laws here are much more stringent than in Germany. The points in which we are less stringent are that no permission is required to start a factory, and that the statutory provision as regards holidays does not apply to adult males, nor does the question of hours of work. In practically all other respects the English law is more detailed and more extended. The provisions of the English law are more precise, more rigid and minute. The German law is better than ours in the inclusion of good light; this essential is ignored in the English laws; it is also more elastic and freer from minute hard and fast requirements. According to the report of the chief factory inspector, although lighting is not included among the standard requirements of the Act, occupiers have been reminded by circular that every workroom should have adequate windows, as well as adequate means of artificial lighting for the proper illumination of all parts in which persons are permanently employed; this is especially important in those kinds of fine work, especially on dark materials, which involves strain on the sight.

Much more is left to the discretion of the

executive, and more elasticity is allowed in adjusting the means to particular circumstances. Of course, we started much earlier on our industrial career than Germany did, and she has kept in view the necessity of encouraging the developments of industrial enterprise in the interests of the public, as well as the health of the workers, and has tried to strike a balance between the two interests. Further, one must remember that the conditions of factory life have been vastly different. With us, the development of manufacturing industries came so much earlier; we have consequently a large proportion of old-fashioned factories which do not come up to modern ideas, and English workpeople are very tenacious of old custom and cannot be described as docile.

Again, our industries have not required the same careful nursing that those of Germany required. The Napoleonic wars swept the seas of practically all commerce outside England, and we had for many years a glorious monopoly of all export carrying trade.

Still, the English factory laws are a striking instance of the "*laissez faire*" practice in this country—the practice of only dealing with troubles as they arise, without any plan or conscious aim beyond the immediate point. Yet if we except the German State Insurance—which includes both sickness and death, and which provides sanatoria for the consumptive workpeople—the English code is better by the superior protection given to the women and young persons, and the more stringent regulations with regard to dangerous trades.

We have for years recognised that the physical conditions under which work is carried out exercises a decided influence on efficiency, and through this the health of the workers has benefited. Delicate processes, for example, cannot be carried out only in a good light; air, which is one of the most important points in regard to the health of the workpeople, is well looked after in both England and Germany. As far as my experience goes, the atmosphere breathed in factories is better than that in any other buildings frequented by the working classes. It is better than schools, churches, chapels, theatres, or public houses, and infinitely better than that breathed in their own homes. The Departmental Committee appointed by the Home Office to investigate the air in

factories reported that in one large public hall the air of which was examined at different points and at different times in the evening, the volume of CO_2 varied from 14.20 to 44.4 per 10,000, a much higher average than obtained in any factory. The popular idea that the air in factories is bad and injurious to health is derived from an earlier state of things and does not, as far as I know, hold good to-day. The following extracts from the Report of the Chief Inspector of Factories for 1907 are of interest:—

"Two kinds of standards of ventilation are recognised by the Factory Act—the hourly delivery of fresh air, and the proportion of carbonic acid in the air of the room. The two are theoretically commensurate on certain assumptions, namely, that on an average 0.6 cubic feet of carbonic acid is given off per head per hour in respiration, and that the fresh air and impurities are uniformly diffused throughout the rooms (a condition which can never be literally fulfilled). It is necessary also to take into account the proportion of carbonic acid in the open air; this is generally assumed, for purposes of calculation, to be four per 10,000, but it is usually less and may occasionally be more.

"With a fresh air delivery of 600 cubic feet per head per hour, the proportion of CO_2 in the air of the room will not average less than fourteen per 10,000. It must be somewhat greater in parts, and much greater if the diffusion is faulty. Any short circuiting between inlets and outlets implies removal of comparatively pure air, and some degree of failure as regards the intended removal of the impurities, so that the air of the room will be more contaminated."

A standard of fresh air delivery is applicable only to rooms with mechanical ventilation, and it has the drawback that the delivery can only be estimated, anemometrically, from the ascertained velocity of part of a current which flows more rapidly at the centre than at the side. Uniformity of diffusion throughout the room is a relative matter not easily determined, but many installations are found to admit of obvious short circuiting, and others to be wanting in adequate counter-openings. The only present example of such a standard under the Act is that of the order of February, 1902, which requires 600 cubic feet per head per hour in humid textile factories, other than cotton cloth factories, not under regulations with regard to humidity.

Carbonic acid standards are in force in textile factories. In humid cotton cloth factories the limit is nine per 10,000, without any modification to meet the use of gas for lighting or allowance for occasional excess of CO_2 in the open air. It has been necessary in practice to allow for these omissions. The rooms are large, with abundant air space, and mechanical ventilation, and it is found that the standard can be maintained in daylight, when the installations are well planned and kept in order. A 9.0 standard is also required, under regulations, in flax, hemp, and jute mills, in daylight, but when gas is used the limit is 20.0. Alternatively, the requirement is held to be satisfied if the CO_2 does not exceed that of the open air by more than five parts per 10,000. Here again the rooms are spacious, and mechanical ventilation is available. The regulations require also due precautions against direct draught. In smaller and more crowded rooms, or without mechanical ventilation, such a standard would present greater difficulty. The Ventilation Committee in 1902, proposed a 12.0 standard for factories and workshops generally, and this has been useful as a general guide to the inspectors in the absence of a prescribed limit.

The statutory requirement is that the limit shall not at any time during working hours be exceeded in any part of the room; but it has been the practice to take the samples at the breathing level in the working parts of the room, away from inlets, outlets, or sources of CO_2 .

In "dry" textile mills adequate mechanical ventilation can be, and often is, applied; but, in some of these, and notably in cotton weaving, complication occasionally arises from the dryness of the outside air. The operatives object to any humidification, and under certain atmospheric conditions the free admission of untreated fresh air would interfere with manufacture, while with imperfect ventilation the moisture from respiration prevents undue dryness. It is hoped that the report of the Humidity Committee, to whom this question has been referred, will afford a solution. The present position is far from satisfactory.

As regards large rooms, with large air space per head, in factories where power is available for mechanical ventilation, the problem presents comparatively little difficulty. Already great progress has been made in the

last few years, and the increasing use of exhaust for removal of dust and fumes has, in many cases, brought about better general ventilation also. The growing facilities for supply of electricity render fans more available even in the absence of other power. Given an adequate installation, with proper counter openings, diffusion, and avoidance of short circuiting (conditions which are by no means always observed, even in costly installations), the ventilation will always be good as long as the appliances are kept in order and used. In such cases, determination of air delivery and CO_2 are rarely required, except at the outset. It is usually enough to see that the fans are properly at work.

When, however, there is no power, and the air space per head does not greatly exceed the statutory minimum of 250 cubic feet, it is less easy to secure adequate ventilation at all times, especially in small rooms. Windows, doors, and even ordinary ventilators are too readily closed, and even apart from this the delivery of fresh air is dependent upon wind outside and upon differences of internal and external temperatures. Some constant ventilation is assured when open fires, stoves with flues, or even ventilated gas-burners are in use, and these are most available in cold weather, when the tendency to close other openings is greatest. But, as a rule, natural ventilation connotes inconstancy of air delivery, so that with limited air space per head, constant observance of any strict CO_2 standard would be difficult without fans. Inspection has to be directed mainly to the adequacy of the several openings, to their maintenance from hour to hour, to the precautions against direct draughts from inlets, and to the necessary supervision on the part of the employer, although CO_2 determinations are useful in confirmation of unsatisfactory results. Imperfect ventilation is far less apparent to the inmates than to a person entering from the outside.

Both in this country and in Germany the regulations as to overcrowding are very sound. Still, I think that the question of cubic space has been allowed to occupy too great attention. More good could be done in securing purity of air by increased attention to ventilation, by increasing the supply of fresh and the removal of foul air. Fans cannot be tampered with by workpeople who generally prefer a hot and stuffy atmosphere, and make a practice of closing windows and blocking up ventilators.

I came across a very notable case of this

kind in one of my factories. The manager, imbued with a desire to promote the health of his people, at great expense installed a series of Tobins Tubes in each room in his mill. Within a month every tube was blocked up with cotton waste and put out of action. Dr. Shadwell gives a similar instance which came under his notice at the Westinghouse, in Trafford Park. He says: "the installation is magnificent and embodies numerous modern improvements. Among others are a number of Smith's forges, with a down draught which carries off all the smoke. The atmosphere is perfectly clear in the midst of a score or more of open fires. I stopped at one of the forges and said to the men, 'This is a nice arrangement, isn't it?' 'Well,' said one of them, 'we aren't accustomed to these ere fires.' 'What's the matter with them?' 'Just about good enough to boil your can on.'"

This is typical of the English workman; rather than change he will put up with smoke fumes, dust or anything else, no matter how poisonous.

The fencing of machinery is carried out much more thoroughly in England than in Germany; in America it is almost ignored. As regards sanitary provisions, we are behind both Germany and America, and not in the same street with Japan. In Japan, I am informed, one never sees the dirty, oily, dust-begrimed workman, so familiar to all of us. In each factory hot baths are provided; the men on coming to work change their clothes, and before leaving have a very hot bath and resume their out-of-door clothing. To revert to the Westinghouse, here there is an elaborate installation of basins for washing, but they are very little used. As soon as the closing bell rings the men rush for outside, pulling on their coats as they go. The British workman loves to be dirty all the week; he takes a pride in his workmanlike appearance. It is the mark of his calling, the honourable proof of toil, the privilege of the horny-handed. On Saturday afternoon and on Sundays, no one is cleaner and tidier.

Now in Germany, cleanliness is taught in the schools, and during their period of military service it is insisted on. They acquire the habit in barracks; their sergeant insists on their washing behind the ears.

At Krupp's works, at Essen, the number of lockers is over 29,000; douche and other baths are provided as well as hand washing places.

I feel that already this paper is too long; the subject is so vast that I have only been

able to touch on the fringe of it, but I should just like to emphasise that, the absence of notification of trade poisoning in Germany, which renders it impossible to say with any accuracy where and to what extent protection is required, and how far the measures taken are effectual, and the system which exists in the United States of allowing each State to formulate its own code, give to the English code a decided superiority.

THE EMPLOYMENT OF SCHOOL CHILDREN OUT OF SCHOOL HOURS.—I find that taking all the schools together some 25 per cent. of the boys over eleven and a considerable less number of girls are engaged outside school hours in performing work, some of which should bring them under the Factory Acts, and all of which is totally unfitted for them to perform and at the same time attend school. Much of it may fitly be classed as child slavery. I have in my note book cases recorded of boys of twelve years of age having to start work at four or five in the morning, go to school all day, and go to work again until seven or eight in the evening. These are not very common, but it is common that the majority of boys of twelve and upward having to start work before school hours, attend school in the forenoon, work during the dinner hour, and again in the evening. These boys have been reported to me as being dull and sleepy during the day and backward in their work. It is not to be wondered at. Many of them of even more tender age are selling newspapers until late hours, but the majority are errand boys. I have made inquiry in many cases as to the need in the home for this work, but have rarely found that it is real poverty that has necessitated it. I called attention last week to one girl who was working as a domestic servant from 7 a.m. to within ten minutes of school hours, again at mid-day for more than an hour, and again in the evening until 8 p.m., and all day on Saturday and part of Sunday. In one class of boys in the upper standards, when asked how many had to work before and after school hours, more than two-thirds stood up. The mental standard of those who are thus engaged is given me and marked on the record as below the normal. . . . To sum up, this extraneous labour added to school work is causing in my estimation a serious deterioration, and is more detrimental to the children, not being regulated to their physical fitness, than the half-time work of the textile factories, which has had to be regulated by the Legislature, and is gradually being eliminated by the raising of the half-time age. I should urge that advantage be taken of the recent adoptive Acts dealing with this matter, and that no children be allowed to be employed unless they have a medical certificate from the school medical officer or the certifying factory surgeon in the case of those coming under that Act that they are physically fit and holding a license from the authorities that they may perform certain regulated duties.—*From a Special Report by the Medical Officer of Health, Weymouth.*

LESSONS FROM AN OUTBREAK OF SMALLPOX.

By W.M. ROBERTSON, M.D., D.P.H.,
Medical Officer of Health, Leith.

BEING a seaport town, Leith is susceptible to imported cases of smallpox, and as oversea communication between Russian ports and Leith is frequent, the risk is further increased. Usually the cases imported are detected with the arrival of the infected vessel in the roads. But, since the voyage between Russian ports and Leith occupies only a few days, persons infected in Russia, or on the Continent, may not sicken with smallpox until some days after their arrival on this side. The chief interest of the present contribution bears upon the latter point.

On the 11th December, 1907, a steamer arrived from Riga. All were well on board, there being only one passenger, a seaman, invalided from Riga Hospital, where he had been under treatment for enteric fever. This man I shall name Smith. He was confined to his house from the day of his arrival in Leith. On the 22nd inst., he sickened with smallpox, notification of that disease following on the 26th. The patient was removed to hospital, and the usual precautions adopted to prevent spread of infection. Smith developed confluent smallpox and died on the 29th.

Nothing untoward occurred during the sixteen days subsequent to Smith's removal to hospital, and hopes were entertained that the spread of the disease had been checked. Suddenly, however, we were confronted by an unexpected development, since between the 11th and 16th January, 1908, twenty-two cases of smallpox were notified in Leith, and six in Edinburgh. The situation became serious. Fortunately the district invaded was, for the most part, a better class one.

As soon as we had recovered from the temporary confusion, a minute investigation was instituted, with, however, disappointing results. None of the twenty-two patients in Leith had anything in common, and none of them had ever heard of Smith or his wife.

The steamer that had brought Smith to Leith had been laid up, and her crew paid off. Those members belonging to Leith were again visited and found in good health. The others could not be traced. During the round of visitation, it was learned that, despite Mrs. Smith's denial of visitors to her husband, an insurance representative and two girl tea

canvassers had called on the evening of the 25th December, the day before Smith was taken to hospital. When questioned regarding her suppression of this information, Mrs. Smith, as is usual with unthinking persons, pleaded that she did not consider her visitors of sufficient importance to tell us anything about them.

The next step was to seek out the visitors. The insurance representative, afraid of quarantine, no doubt, denied his visit to Smith. Yet, be it observed, my clerks, subsequent to Smith's death, corresponded with the insurance company on behalf of the widow, who exhibited an entry in her book proving the traveller's call on the 25th. Happily no infection could be traced to this man.

With the tea canvassers it was different. Three houses visited by them were, a fortnight after their call, invaded by smallpox. Great difficulty was experienced in securing reliable information from these girls. They adopted a policy of denial. They said they had no bags, no parcels and no books with them in Smith's house. Part of their story was contradicted, since a book was produced to indicate to Mrs. Smith how heavy were her arrears of payments.

Parenthetically, the suppression of truth by Mrs. Smith, the insurance representative and tea canvassers, illustrates but too well some of the many obstacles that confront those called upon to deal with the arrest of smallpox outbreaks. During the severe outbreak of 1904, two navvies were, at an interval of fourteen days, removed to the Edinburgh Smallpox Hospital. They worked in the same gang and knew one another, but when taken to hospital they denied previous acquaintanceship! That is a parenthesis which I could not resist. Other instances could be quoted, but space forbids. It is a point to which those who believe in the aerial diffusion of smallpox ought to give due heed, since, when connecting links between cases are lost, the refuge sought is hospital influence, especially if the hospital be near the cases under notice.

To return to the almost simultaneous occurrence of twenty-eight cases in Leith and Edinburgh, Smith was not the cause, neither were the visitors to his house. The only theory that could be advanced appeared to me to be the following. It was thought highly probable that a member of the crew who had come over from Riga had contracted smallpox at or about the same date as Smith. Further,

it was presumed that this second patient, subsequent to being paid off, had spent his wages in a manner common to his class. When his means were exhausted, he proceeded to beg from door to door, a habit familiar to the police in Leith, and doubtless common in other seaport towns. If, then, this supposition was the correct one, the infected man palliated his premonitory headache and back-ache with further libations. That his illness was of a mild type was suggested by his being able to beg. Smith's rash was fairly typical on the 26th; the second man's eruption would also be acute on the same date. He probably began to beg on the 27th, that date being mentioned because, in the majority of the twenty-eight cases already mentioned, incubation dated from the 27th to the 29th December.

The mendicant theory has support lent to it by a reference to the local map, upon which could be traced, with striking precision, the route followed. The path of infection could be closely traced along one street, down another, round a corner here, into a side street with a blind end, then along a terrace of better class houses, subsequently across an open meadow to infect another district, and, finally, over the boundary line to attack six houses in Edinburgh. No new cases could be ascribed to the supposed mendicant subsequent to the 29th inst, that being a Monday, the presumption being that the infected seaman had signed on with another steamer, and had left Leith.

Additional support to my theory was afforded by the removal to hospital of five domestics who had probably come in contact with the beggar. At those houses where servants were kept, no other inmates were infected. Then, again, that Friday, 27th December, was the date when infection was principally spread, was suggested by the following case. One of the maids taken to hospital was cook in a medical man's house. When pressed to recall visits paid by pedlars, she was unable, like all the other patients, to bring back to mind what had taken place a fortnight before. Indeed, she could not understand the suggested contact between herself and any caller, because she never answered the door, except on Friday evenings, when the other servant had her night out.

Two clues came, but neither could be turned to advantage. One was the removal to hospital of a seaman who had slept in the Sailors' Home between the 21st and 27th

December, his incubation dating from the 25th. The other was the infection with smallpox of a woman and her two sons. The woman was in the habit of washing clothes for seafaring men. She was unable, however, to give any information that could assist in tracing the suspect.

The Leith outbreak being a comparatively small one, it was possible, with few exceptions, to connect the cases with one another. "Leakage cases" did occur, but they were so far removed from the smallpox hospital that no account need be taken of them in connection with the aerial diffusion theory. Besides, one has but to recall the illustrations given of truth suppression to understand how "leakage cases" can arise. Two of these were accounted for in a peculiar way. After her husband's death, Mrs. Smith was re-vaccinated and engaged to assist in the kitchen at the smallpox hospital. Two "leakage cases" recognised her in the hospital, and gave the information that she had called on them on the evening of the 25th December. Mrs. Smith had informed the epidemic officer that she had "never crossed her door" from the 24th!

The ready way in which smallpox may be conveyed by those who have been in contact with the disease, had more than once been forced upon me. It is now a standing instruction in every instance to require the outer garments of actual contacts to be handed over for disinfection. I am convinced this precaution has been a good one. It increases our labours, but it may obviate much mischief.

Had the afore-mentioned two cases, and several others which came under my notice, occurred within a reasonable distance of the smallpox hospital, and had no trace of infection been discovered, I fancy the inference drawn would have been that infection had been wafted from the hospital.

To come to closer quarters, however, let me deal with the hospital itself. It is a wooden building erected in a hurry to deal with a serious epidemic of smallpox in 1893. From the aerial convectionist's point of view, the hospital could scarcely be in a worse position. Fortunately the building has been condemned, and, in all likelihood, will soon be demolished.

Immediately behind the hospital, and separated from it by a fence of disused railway sleepers, is a large ropery establishment, giving employment to several hundred persons. Some of the men work in sheds not more than thirty yards distant from the ward windows.

To the left of the hospital is open space; to the right, and 120 yards distant, is a large modern tenement, the windows of which overlook the hospital grounds. Beyond the tenement is a fairly densely-populated district, the inhabitants being, for the most part, artisans. In front of the hospital is a meadow, part of which, close up to the boundary fence, is used as a public drying ground. A much-frequented path also passes within forty yards of the hospital gate. On the other side of the meadow, and within the quarter-mile zone of the hospital, is a large residential district. On three sides, therefore, the hospital is beset by human habitations. The tenement protects the hospital, to some extent, from the prevailing winds, but, when most patients were in hospital (twenty-three), gales of wind continued for a week to sweep over the hospital in the direction of the tenement and ropery. The force of the wind was so great that damage was done to the hospital and a long stretch of boundary fencing was levelled to the ground. What influence, then, had the hospital in sowing infection about it?

First with regard to the ropery. From it two cases were taken to the smallpox hospital, one a man, the other a poorly vaccinated youth of sixteen. At odd times the workers stood at the boundary fence and bantered the patients and hospital staff. Now, and again, during their meal hours, the employees kicked a football into the hospital grounds. At first some of the patients, good naturedly, handed the ball over again! This practice was stopped; but, none abashed, the workers leaped over the fence after the ball and recovered it amid the plaudits of their fellows. The nurses were disturbed at night by tappings at their own and the ward windows. Lastly, the ash-pit was close to the fence that separated the ropery from the hospital grounds. Into this refuse-heap were cast floor and other sweepings.

As is well known, a common practice among smallpox patients in the convalescing stage is to pick the "blackseeds" from the soles of their feet and the palms of their hands. These "seeds" fall to the floor, are swept up, and if by chance, instead of being burned, they reach the ash-pit, it is not difficult to imagine how infection may be blown about. In the face of all these circumstances, is it not a matter for surprise that only two ropery workers became inmates of the smallpox hospital? From the tenement property, four

cases of smallpox were taken to hospital. Every case had connection with the other, the first being infected on the 27th December, by the presumed mendicant. If one were to sum the matter up, it would be to say that, despite the fact that the hospital was scarcely deserving the name isolation hospital, its power for mischief had been negligible.

If concentrated poison is required to spread infection, then the instance of four acute cases of smallpox lying in an insalubrious den may be quoted. A husband and wife and two sons were accidentally discovered as victims of smallpox. The low-class tenement in which they lived was a warren of human habitations. No other cases occurred on the same landing, nor in the houses above nor below. Fortunately, from the official standpoint, the neighbours were not on friendly terms with those infected; opportunities for personal contact between them were thus rare.

Lest the citation of Leith smallpox hospital be objected to on account of the limited number of cases in hospital at one time, let me borrow from the experience of Edinburgh. Dr. Claude B. Ker, the Physician-Superintendent of the Edinburgh fever hospitals—no mean authority on infectious diseases—gave his views in the *Scottish Medical Journal*.

The Edinburgh smallpox hospital is wedged in between the large modern fever hospital and the Craiglockhart poorhouse. During the outbreak of smallpox in 1904, the population of the former was 450, and of the poorhouse 1,000. The main buildings of the latter stand within the quarter-mile radius of the smallpox hospital. In fact, within the quarter-mile radius, there is a population of 1,500 persons, and within the mile radius 5,000. Not a single case attributable to hospital influence occurred. Three cases arose in the poorhouse, but two sickened shortly after admission to that institution, and before they came under the alleged baneful influence of the smallpox hospital.

"Moreover," to quote Dr. Ker, "there was just as much smallpox in the other city poorhouse, several miles away." Any other cases that occurred within the mile radius were satisfactorily explained. Dr. Ker is careful to point out that the vast majority of the patients in the fever hospital were by reason of their youth protected by vaccination. But, the two pavilions nearest the smallpox hospital were occupied by cases of erysipelas, for the most part adults. These pavilions were only seventy-

two yards distant from the smallpox hospital. No vaccination was attempted, and no cases of smallpox developed. In the poorhouse vaccination was only practised in the infected dormitories.

The average number of patients in the smallpox hospital from the middle of January until the middle of April, was 47. From February till 31st March, the daily average was 55. In the case of Glasgow and Liverpool, 50 cases were asserted to exert hospital influence.

"I think," says Dr. Ker, "I may claim that these advantages of situation and nursing make the Edinburgh smallpox hospital a very fair test in the controversy, as infection except by air is very improbable." When the foregoing immunity was brought under the notice of Dr. Buchanan, of the English Local Government Board, he sought to explain it away by asserting that, "Craiglockhart Hill protected the neighbouring districts." To this Dr. Ker retorts, "This is not the case. Under no consideration could it have protected the 1,000 persons in the poorhouse, nor, indeed, the greater part of the population of 3,000 which lives beyond. On the contrary, if anything, it must have diverted the prevailing winds more directly upon the poorhouse." Dr. Ker ought to know. He lives on the spot and looks at Craiglockhart Hill every day. "But one conclusion is, I think, self evident," Dr. Ker concludes: "that is, that the Local Government Board regulations are of too hard and fast a character, and may also be regarded as 'vexatious.' Particularly unwarrantable is the recommendation not to have a smallpox hospital near the permanent fever hospital."

I am not surprised that the number, fifty, is taken as the critical one. When so many cases have occurred, and are in hospital, one can imagine how many contacts there have been, and how many modified cases have escaped notification. Each contact is, as I have shown, capable of doing mischief. If this mischief chances to be wrought within a theoretical danger zone, why rush to the conclusion that it is the hospital that is at fault? One cannot overlook the many concealed factors that are at work in spreading the disease.

If my memory serves me rightly, the east end of Glasgow was the spot first invaded by smallpox during the last severe outbreak, and the brunt of the epidemic settled upon that

part of the city, which is thickly-populated. The outbreak had gained a good hold before the health authorities had the opportunity to grapple with it. The smallpox hospital is in the east end, at its outer fringe to be accurate. It was accordingly reasoned that the hospital kept the epidemic going in the east end. Had the west end been first attacked, and the east subsequently invaded by a more serious outbreak, one could have followed the reasoning. Yet, one who knows the east end can scarcely wonder that it should become a hot-bed of infection, and that quite apart from hospital influence.

In 1881, Mr. Power formed his well-known conclusions regarding the evil influence of the Fulham smallpox hospital. It was shown, by the aid of maps and circles drawn round the hospital, how many more cases occurred within the vicinity of the hospital than further away from it. Mr. Power referred every case within the respective zones to hospital influence. Now, incredible as it may appear at the present time, many cases of smallpox were nursed in their own homes at Fulham. That fact suggests much. Dr. Tripe followed Mr. Power's investigations and quoted one case nursed in a densely populated alleyway, from which he was able to trace fifty others. Yet all had been grouped under one category by Mr. Power.

At Nottingham, the windows of a factory overlooked those of the smallpox hospital. Many of the workers had never been even vaccinated, yet not a case occurred among them. At Deptford, the spot-maps showed the heaviest incidence of cases as one approached the hospital on one side. A railway separated the streets on the other side from the hospital, communication between it and the houses being almost impossible. The streets beyond the railway enjoyed comparative immunity from smallpox.

At Sheffield, visitors entered the hospital and slept in it during the height of an epidemic that was said to have been kept going by means of the spread of aerial infection from the hospital. It has now come to light that swimmers went out to the hospital ships on the Thames.

It was because Mr. Power believed the aggregation of cases in smallpox hospitals led to diffusion of infection, that the Metropolitan Asylums Board resolved to alter its system. Under the changed method, only twenty to thirty cases were treated at one time in the

smallpox hospitals. The results, instead of proving beneficial, were the reverse. In fact, there were more cases of smallpox in Hampstead under the new order of things than when 600 were in hospital at one time. Formerly, the patients had been retained in hospital until they were free from infection; the new conditions necessitated the frequent removal of patients during the desquamation stage to the camp hospitals. Further than that, mild, but nevertheless acute cases, were, after detention in hospital for a few hours, also removed. By seeking to overcome aggregation, the authorities only encouraged the diffusion of infection by the off-repeated removals of patients to and from the hospital. In the face of such facts, one cannot be expected to place much reliance upon spot maps and circles as evidence against smallpox hospitals.

In conclusion, if reports are to be formulated regarding the alleged evil influences of smallpox hospitals, the reporter must follow at the heels of those actively engaged in combating the spread of the disease itself. He may observe for instance, infected bedding being thrown from a window three storeys up to the waiting "bedding van" down below. He must be careful to observe the manner in which contacts are traced and kept under observation. I need not, however, outline the plan for the would-be investigator. He must do his own prospecting. I might, however, turn his serious attention to the possibilities from crowds of sightseers who press forward and jostle the bearers and stretcher conveying the patient to the ambulance.

I began as a believer in the aerial diffusion theory. Actual participation in several smallpox outbreaks has changed my mind.

A NOVELIST'S VIEW OF THE MEDICAL OFFICER OF HEALTH.—"It should be a part of the organisation of a civilised State to have a public health service of well-paid, highly-educated men distributed over the country and closely correlated with public research departments and a reserve of specialists, who would be as ready and eager to face dangers and to sacrifice themselves for honour and social necessity as soldiers and sailors. It is, indeed, a transition from private enterprise to public organisation that is already beginning. We have the first intimation of the change in the appearance of the medical officer of health, underpaid, overworked and powerless though he is at the present time."—H. G. Wells, "New Worlds for Old."

ENTERIC FEVER ON BOARD SHIP.*

By A. K. CHALMERS, M.D., D.P.H.,
Medical Officer of Health, Glasgow.

DURING the year 1907, an outbreak of enteric fever occurred on board a liner trading with America, which presented several features deserving of notice. In all, there were ten cases between August 10th and September 19th—a period long enough to allow of the vessel returning to this country from America, and again completing her voyage outward.

The patients included the saloon steward, two stewardesses, an engineer, two lady passengers travelling in the saloon, and the third officer, the purser, the second cook, and the captain. The first illness dates from August 10th, three days after the arrival of the ship in the foreign port, and was in the person of the saloon steward, whose berth was in what is colloquially known as the "glory-hole," or sleeping quarters of the stewards, and was in this case situated under the water line, in the fore-peak. He was nursed here for two days by the stewardess, who sickened on August 21st. From August 12th to 15th he was treated in the ship's hospital as a suspected case of enteric fever, the stewardess meanwhile continuing in attendance on him. The sequence of sickenings thereafter was as follows:—

August 21	...	The stewardess.
" 22	...	An engineer.
" 25	...	Two lady passengers and third officer.
Sept. 6	...	Another stewardess.
" 8	...	The purser.
" 12	...	Cook.
" 19	...	Captain.

These cases would appear to fall into three groups, the first sickness standing alone, the second group including the five sickenings within four days, August 21st to 25th, and thereafter the four sickenings occurring separately at intervals between September 6th and 19th. The three officers of the second group remained on duty till the arrival of the ship in Glasgow on August 25th, and the first patient of the subsequent group sickened on the thirteenth day thereafter (September 6th.) During the first six days of the interval (August 25th to 31st), the ship was in dock in Glasgow.

With regard to the origin of the first illness, as the ship left Glasgow on July 28th, it is probable that the infection was obtained in this country. But from the eleventh to the fifteenth day after this sickness began, five others became ill, and was undoubtedly secondary to this attack.

During the first two days of his illness, the patient was attended, as has above been said, in his bunk by the second cabin stewardess, who meanwhile also performed her other duties.

She herself sickened on August 21st, an engineer on 22nd, and two lady passengers who had joined the ship at Montreal not later than August 15th, sickened ten days thereafter, namely, August 25th, when, also, the third officer sickened. This date corresponds with the arrival of the ship in Glasgow.

We may now endeavour to discover the relation which each of these bore to the patient in the "glory hole." The stewardess's infection is easily accounted for. She was dealing with an infectious disease without knowing it, and her experience is frequently repeated elsewhere. The two lady passengers who joined at Montreal not later than August 15th travelled in the saloon, and used the same lavatory accommodation as the stewardess. The engineer's quarters were in a different part of the ship, while the third officer's quarters were in a house on deck aft, and opposite those of the engineer.

The interval which now occurred extended from August 25th to September 6th (and during the first six days of which the vessel was in the harbour of Glasgow), when another stewardess sickened, and thereafter on the 8th, 12th, and 19th the purser, second cook, and captain fell ill in sequence.

Regarding the illness of the stewardess of this group, it may be observed that she used the same lavatory accommodation as the one who had formerly sickened.

The purser had accommodation on the deck amidships, but had transferred on August 28th to another ship, on which he sickened eleven days thereafter. Regarding the second cook, it is noted that he slept in the same "glory hole" occupied by the first patient during his illness, while the captain sickened, as stated, on September 19th. Some time between September 19th and 27th the ship was in collision, and this led to considerable repairs, and the cessation of the enteric fever.

Source of Infection and Method of Spread.

As has been said, it is possible to separate the source of infection of the first case from the others which followed. The first patient obtained his infection before joining the ship, most probably Glasgow.

During the development of the sicknesses, the vessel made a voyage each way across the Atlantic, and was for some period in ports on both sides. Two only of the patients were passengers, and these were ladies on whom the stewardess, who was the second case to sicken, attended, along with her other passengers. All the other patients were officers or members of the crew.

The first group of secondary cases, numbering five, sickened within four days, namely, between August 21st and 25th; the second group, numbering four, sickened, as has been said, over a period of a fortnight, between September 6th and 19th. Between the concentrated stream of infection, which in four days claimed five victims, and the irregular movement, which in a fortnight only caused four, there is a contrast, which suggests that the method by which the infection was spread in each case was different. Water was excluded by the absence of cases among the passengers (save in the two instances quoted), and by the lack of any considerable degree of simultaneity in the dates of sickening of all. Even common use of the lavatory accommodation lacks a sufficient basis of argument in its favour, because six of the ten patients used lavatories in common with a large number of both passengers and crew. It was observed that many of the patients remained on duty, or without attendance, during the early days of their illness, and the sequence of events, and particularly of the cases occurring in September, suggests that the infection was such as must necessarily happen where infectious disease is handled without being recognised, and food becomes liable to contamination either by direct soiling from unclean hands, or by other methods of transference by insects, which are now recognised.

If, indeed, one could imagine accidental transmission of infection on the feet, not only of insects, but of vermin on board ship, the distribution of the cases in the last fortnight would be explained. It suggests an occasional and not in any sense a constantly acting infecting agent. Here one of the patients was the stewardess, another the

purser, the third was second cook, and the last patient of all was the captain.

Sleeping accommodation, lavatory accommodation, almost everything was different, and yet unquestionably these illnesses arose from a strain of infection remaining on board from a patient who sickened on Aug. 21st.

It was impossible, however, without inquiry, to set aside the question of the part played by the water supply, and as the result of this I have asked Dr. Wilson to prepare a report on the methods of storage and distribution of water on board ship, and that report is appended hereto.

STORAGE AND DISTRIBUTION OF DRINKING WATER ON BOARD SHIPS.

The importance of a pure water supply stored and distributed free from contamination is as much a necessity to health on board ship as to health on land.

Quicker voyages and the possibility of more frequent renewals of fresh water may counter-balance the vastly greater amounts required on the great ships of to-day, but the sources and dangers of contamination, both in the methods of storage and distribution, are proportionately increased with the elaboration and complexity of the methods adopted.

METHOD I.—The simplest and earliest method is that still in vogue on the smaller sailing vessels, viz., two or more stout wooden barrels, usually of a flattened oval shape, securely fastened to the deck in pairs abaft the masts. In these the water may be kept wonderfully clean and sweet, since they are movable and easily enough cleaned. The water for use is withdrawn by means of a long, round, narrow tin, called a "dipper," which passes through the bung-hole, and is kept suspended in the water by a cord attached to the bung.

METHOD II.—This method, used in larger sailing vessels and smaller steamships, differs from the first only in that the reservoirs are square-shaped iron tanks provided with an oval manhole, the cover of which is perforated, and the water withdrawn either by a suspended dipper, as described, or by means of a tap placed an inch or two above the level of the bottom.

METHOD III.—In the large tramp steamers, built fifteen to twenty years ago, huge tanks were built into the ship.

In these older vessels one finds such tanks resting on plates or supports, e.g., in the forward hold, reaching upwards nearly to the 'tween-deck. They are placed one on each side of the vessel, the inner side plates being perpendicular and parallel to each other, the outer side plates following the curve of the ship's sides, but leaving a space between, which is intersected by the connections between the tanks and the ship's frame. The bottom of such a tank would thus measure only two or three feet in width, whilst the top of each would be almost the width of half the 'tween-deck, and to reach the manhole, one must crawl between

the tank top and the 'tween deck. Such tanks are sometimes met with singly, built into the fore or after-peak of a vessel. Large built-in tanks are also sometimes found built one on each side of the engine-room, and resting on the 'tween-deck.

If a single large tank is used, and not placed either in the fore or after-peaks, it is usually found in the hold amidships, supported on plates raised a foot or so above the keelson. They are often oval in shape, and reach up to the 'tween-deck, the manhole having an outward curved lip two or three inches above the level of the 'tween-deck to keep deck washings, etc., from getting on to the manhole cover.

All large tanks are provided with movable plugs on a level with the bottom for washing out sediment, etc., the water tap always being on a higher level.

The water for use is raised to the deck by means of hand-pumps, usually fixed somewhere near the galley.

METHOD IV.—*Cellular Tanks.*—Recently, where large tanks like those described would be required, either a number of smaller square ones or one (or two) large "cellular" ones are used for the storage of drinking water. (Tanks of all sorts when used as reservoirs for water intended for domestic purposes are called "domestic tanks.")

The cellular "domestic tank" is a large square iron box divided into cells by means of partitions, inserted for the purpose of restraining the weight of the water when the vessel rolls at sea. These partitions are perforated by manholes which allow the water to pass from one section of the tank to another, and no manhole in one partition is opposite that in any other. They are large enough for a man to crawl through, so that the whole tank can be thoroughly hand-cleaned and cement washed when necessary.

The most usual site chosen for "domestic tanks" is somewhere amidships, and the water is withdrawn from the tanks by means of hand-pumps or direct cocks. The former is usually necessary if the tank site be on or below the level of the main deck, whilst the latter is sufficient when the site is far enough above that level for gravity to provide the effluent force.

In attempting to classify tanks and methods, the object has been to facilitate description, and it should be noted that there exist many combinations of the methods described.

Out of the water, instead of the fine lines ending at the bottom in the sharp keel, in front in the graceful bow and astern in the rounded counters, which one associates with sailing ships, the present-day steamship more nearly resembles a great box or rather warehouse. The bottom is almost flat, and near its junction with the more or less perpendicular sides a sort of keel is placed, one on each side, along part of the length of the vessel, to prevent rolling when at sea (called rolling chokes).

There still remains a few inches of depth of keel along the centre, but the greater part runs along the bottom on the inside, chiefly to strengthen the structure, and called the keelson.

These vessels have two bottoms, the second being about 4½ feet to 5 feet above the lower, or what is called the "skin" of the ship.

The space between is divided up into tanks like the cellular ones described. They are always limited by the holds and the transverse water-tight bulkheads. Any of these bottom tanks, except the fore and after-peaks, may be divided by an imperforate partition running along the keelson, so as to make double or port and starboard tanks in one or more of the holds.

The tanks ending in the bow and stern, called the fore and after peaks, necessarily take the shape of the vessel, and whereas the bottom tanks are square and have a uniform depth of about 4½ feet, those of the fore and after-peak are single, deep, and narrow at the bottom. The depth might be 16 feet to 18 feet, according to the size of the vessel.

The reason for describing these tanks, and the "bilges" which also form part of the double-bottom space, is that the tanks are being used on large vessels to carry reserves of water for domestic uses, and that the bilges, now about to be described, lie close against them—indeed share one partition wall between them, and so form a possible source of contamination to the reserve water.

Bilges.—In sailing and in all older vessels the bilge space is in the centre, but in the newer, "flat-bottoms," except in a few which have unusually fine lines fore and aft, the spaces are at the sides. They are of a V shape, and formed by the outer walls of the port and starboard tanks and the sides or skin of the ship, which curves a little outwards and upwards before rising perpendicularly.

These bilge spaces or wells are divided off by the holds or water-tight bulkheads, as are the water-ballast tanks.

Each "well" is provided with a pump, the bilge end of which is hook-shaped, and has a sort of watering-pan rose end to it. This arrangement leaves the rough sediment behind for periodical special cleanings. The deck ends, to which the suction pumps are fitted when the pumps are not in action, are always plugged with round brass plugs marked "bilge." These openings are also used as "sounding wells," i.e., for measuring the amount of water in the bilge or wells.

The bilge spaces are divided by manhole partitions similar to those of the cellular tanks, and they are more or less about 18 inches or so in depth. They are not covered on the top except by the flooring of the hold, and consequently can be reached only in "light" ships.

METHOD V. is a combination of certain of the aforementioned varieties of domestic tank variously situated, and connected with an overflow distribution tank placed on the highest possible site, viz., the bridge deck, for the distribution of the water over the ship by gravitation. Added to these there is a stock of fresh water stored in certain of the "bottom" or "water ballast" tanks, and connected by steam-pumping power through the emptying pipes already mentioned.

Reserve Water.—I. When used for drinking purposes, the reserve may be pumped directly into the domestic tank, and thence by hand or steam pump up to the "distribution" tank on the bridge deck, or it may be pumped directly into the "distribution" tank, and from there turned by cock into the domestic tanks for special uses, as well as over the ship through pipes for other special purposes, e.g. lavatory basins, baths, the galley, pantries, etc.

II. The cattle water is always stored in the ballast tanks apart from the "drinking" water circulation. It is pumped up either into an overflow distribution tank of its own, and carried along the decks in pipes provided with cocks from which the cattle water barrels are filled, or it is pumped up as in the ordinary emptying process, and carried along the decks to the cattle water barrels by means of connected lengths of hose.

III. In large vessels a special reserve and circulation is sometimes kept for cooking, washing, and such domestic purposes, so as to save the store in the domestic tanks for drinking water alone. In such large combined passenger and cattle ships as the s.s. "Ionian" and s.s. "Sicilian" (Allan Line) there are three classes of water reserves and circulations, viz., that for drinking water, that for cooking and washing water, and that for the cattle water.

Condensed Water and Boiled Water.—The methods of storage and distribution of water on board ship would be incomplete without mention being made of the occasional use of condensed water and of boiled water, special apparatus for the production of one or other of which is frequently carried by vessels as a provision against shortage or contamination of the regular supply.

A *Drinking Water Condenser* is an apparatus connected with the engine cold water circulating pump, and so arranged as to cool and condense steam from the boiler. The condensed steam runs into a tank on a lower level, from which it is withdrawn through a cock placed as already described. Condensers are usually situated in or over the engine-room conveniently to the circulating pumps mentioned.

Distilled or even boiled water is not over pleasant to the palate, but certainly better than brackish or contaminated water.

An *Apparatus for Boiling Water* is a sort of reversed condenser; in the latter the cold water condenses the steam, and in the former the steam boils the cold water. The source of the water to be boiled is, of course, different; it is pumped by hand from the domestic tank into the boiling apparatus, and there rapidly boiled by steam from the boiler, after which it is passed into a special tank, from which it is withdrawn through an ordinary tap cock.

This method of boiling water in bulk is not frequently met with; in fact, it has been noted at the Tail of the Bank on one vessel only, viz., the s.s. "Harald," a Norwegian cargo ship.

On account of this boiling of the water, the captain thought it unnecessary to clean his

domestic tanks more than once a year. The boiled water reservoir, however, was cleaned and cement-washed every voyage.

Overflow and Distributing Tanks.—This tank is simply a small circular boiler placed on the highest available site, viz., the bridge deck. It may rest horizontally or perpendicularly, and is met with of two different patterns.

As already stated, the pumping or filling power, although usually by steam, may be by hand.

The pattern most frequently met with is filled from the engine-room, and pumping is continuous, as all the water which reaches the level of the overflow pipe returns to the reservoir or ballast tank. The pressure within is thus constant while the pumping is in progress.

The second pattern requires intermittent pumping, and is better adapted to hand work. Its overflow pipe rises from the highest level of the tank, and usually ends swan-necked and open, so that the tank is known to be full when the water spouts from this open end. This overflow pipe varies in diameter, and height, sometimes being carried half way up the ship's funnel when greater pressure is required.

Sanitary Tanks.—Sanitary tanks are similar to those just described, and also occupy the bridge deck. They are, however, directly connected with the circulating engine pumping apparatus, and are constantly kept filled with sea water, which is carried through the ship by means of pipes to cisterns for flushing water-closet pans, filling sea-water baths, etc.

For the crew's and steerage latrines, the constant closet flushing is generally carried out through pipes laid directly from the said engine circulating pumps to the closets, and there regulated over the troughs or pans by means of a wrench tap.

In certain tramp steamers this flushing of closets is done by means of a hose, which is also used for deck cleaning, etc. It has its source in the above-mentioned salt-water circulating system.

SPITTING IN A RAILWAY CARRIAGE.—At Marylebone, William Nash, living at Clyde-road, South Tottenham, was summoned for unlawfully spitting upon the floor of a carriage on the Charing-cross, Euston, and Hampstead Railway, contrary to the bye-laws and regulations of the company. Mr. B. O. Bircham, barrister, represented the company, and said that the defendant was seen to spit three times. This was the first prosecution. The defendant admitted the offence. Mr. Paul Taylor remarked that he was glad to see these proceedings taken on sanitary grounds. He ordered the defendant to pay 5s.

CREMATION IN BRITAIN.—At the annual meeting of the Manchester Crematorium Society on November 19th, the chairman gave the following figures of the number of bodies cremated at the various crematoria named during the year:—At Golders Green, 315 bodies were cremated; at Woking, 108; Manchester, 109; Hull, 32; Liverpool, 28; Glasgow, 23; Birmingham, 22; Leeds, 21; City of London, 13; Leicester, 12; Sheffield, 8; Darlington, 6; Bradford, 5.

AN OUTBREAK OF CHOLERA FOLLOWING A HINDU FESTIVAL.*

By T. FREDERICK PEARCE, M.D., F.R.C.S.,
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Health Officer of Calcutta.

AS cholera is the chief danger of all great festivals, I give here a short account of the "Ardhodaya Jog" of 2nd February, 1908.

This great Hindu festival, which only occurs at long intervals, fell on 2nd February, 1908, the previous ones having taken place on 8th February, 1891, and 7th February, 1864. Its date seems to be determined by astronomical celebrations, viz.: "when the moon is in conjunction with the sun in the constellation of Capricorn between its 10th and 23rd degrees (Shravana Nakhshatra). This conjunction must take place on a Sunday and during the day time in the month of Paus or Magha (15th December to 15th February). Pious Hindus on such an occasion consider it a highly important duty to bathe in the sacred waters of the Ganges and worship in some famous temple on its banks. There is consequently a general movement towards the Ganges and its tributaries, and the river Hooghly with the temple of Kalighat are selected for this particular occasion by vast numbers of the Hindu population, both in Calcutta itself and from a wide area around. Old men and women, but also women of all ages prepare for and attend this festival in large numbers.

Great preparations were made for the pilgrimage of 1908, as it was anticipated that an enormous number of pilgrims would come to Calcutta. The attendance of visitors in 1891 was roughly estimated at 1,500,000, but it was freely asserted that at least 5,000,000 might be expected this year.

The forecast in this respect has proved incorrect, as the returns from the railway, and steamboat companies indicate that the number of pilgrims certainly did not exceed and probably was less than that of 1891.

The sanitary and medical arrangements were made by the health department, but special preparations on a large scale were made by the railway authorities for the arrival and departure of the pilgrims and by the police with regard to the regulation of the traffic.

From previous records a cholera outbreak was expected, and the sanitary arrangements were chiefly based on the probability of this occurrence. Cholera is always more or less in Calcutta, and the district of Kalighat has an unenviable notoriety with regard to this disease. In October and November of 1907, there had been a sharp though not an extensive outbreak, but during December and January (1908) Calcutta was comparatively free.

The preparations made consisted chiefly—

1. In the erection of filtered water posts at every 100 feet along all the principal roads leading to Kalighat temple in order that there should be

no excuse for resorting to the use of the contaminated water of roadside ponds or of Tolly's Nullah.

2. In the construction of suitable latrines connected with the sewers at a large number of convenient sites.

3. In structural improvements with regard to drainage in the courtyard of Kalighat Temple.

4. In a thorough and regular inspection of the food supplies of the neighbourhood.

5. In the regular inspection of all pilgrim houses and provision in many of them for the first time of a filtered water-supply.

6. In the employment of a large extra staff for cleaning the roads, ditches, latrines and urinals.

7. In the chemical treatment of all the tanks in the neighbourhood to purify the foul waters contained therein, and in the placing of police guards over these tanks to prevent the water being used for domestic purposes.

8. By the stoppage of all traffic along Tolly's Nullah in order to avoid the excessive crowding which occurred in 1891, and the additional fouling of the stream, together with the issue of warning notices against the use of the water of the Nullah as likely to cause cholera, dysentery and other bowel complaints.

9. In the establishment of a special hospital at a convenient distance from Kalighat for the reception of cholera cases. Accommodation was available here for 100 beds. The Goragatcha Municipal (smallpox) hospital was also got ready, and the Campbell Hospital authorities (Government) also prepared an additional 120 beds for cases of cholera. Altogether provision was made for over 400 beds.

10. A dispensary was established at a central site for cases of temporary illness and hospital assistants visited the pilgrim houses to give medical relief for slight cases of sickness.

11. In the provision of a large number of ambulances with complete staff of bearers at different stations in the pilgrim area of Kalighat and along the banks of the river in the northern part of the city.

12. In the thorough disinfection of places from which cases of cholera or other dangerous disease were removed.

13. In special arrangements made for the disposal of the dead at Shanagore Burning Ghat and for the conveyance of the dead thereto. All unclaimed bodies were without delay disposed of at the public expense.

14. In the construction of a small temporary cholera hospital in Jorabagan Square, in the daily inspection of the dharmshalas in Ward VII., and in provision for drinking water and latrine accommodation at the Zoological Gardens. The railway authorities also made accommodation of a similar character.

The pilgrims did not come until two days before, and the day before the festival, and owing to the excellent police arrangements there was no crush, and but little crowding.

There was much less sickness than expected. Only twenty patients attending the dispensary, although the peripatetic hospital assistants were fairly busy. A band of medical students and others gave assistance, and rendered aid in over 150 cases, many of which were taken to the hospital.

The cholera hospital proved to be larger than was required, only thirty-eight cases of sickness being admitted, and by the 11th February all the pilgrims had departed. Of thirty-five undoubted cases of cholera twenty-six died, but nearly all the cases were in a most critical state at the time of admission, notwithstanding that the arrangements provided for removal to hospital with the least possible delay. Saline injections were used in many cases with satisfactory results, affording temporary relief even when a fatal termination was not averted. Comparison with 1891 shows that the cholera mortality at the recent festival was very small. In 1891, during the period of the Joga month, 257 deaths were reported in Kalighat (Ward 22) alone, whereas only fifty-eight deaths were registered for this year. For the whole months of February, and for the whole of District IV., viz.: Wards, 18, 21, 22, 23, 24 and 25, only 144 deaths from cholera were reported, whereas in 1891, 556 are recorded.

This festival has, however, been followed by a diffused outbreak of cholera throughout the city. It was so in 1891. Although the mortality from cholera was less for the month of February, 1908, than in 1891, the subsequent dissemination has been more disastrous.

For the past month (March) 735 deaths have been recorded as against 335 in 1891. The northern half of the city, since the second week in February, has been chiefly affected. Cholera has also been raging in surrounding parts and has severely attacked several parts of Bengal. It cannot be said that the whole of this dissemination of cholera with its high mortality is attributed to the *Ardhodaya Jog* festival. At the same time when we know that for the two weeks before the festival the cholera deaths amounted to twenty-four and twenty-three respectively, while within a week they rose to 104, and the disease became widely distributed over the city, the northern wards suffering equally with the southern, we cannot shut our eyes to the dangers of these great concourses of people in the dissemination of such a disease as cholera. The infection is carried far and wide, and no one can tell where the danger ends. It is not only the pilgrims who suffer, the permanent residents of the city become even more severely attacked. We shall not be far wrong in stating that Calcutta has lost 1,000 of its inhabitants as the result of the cholera outbreak following the festival of 1908. The pilgrims bring cholera with them, they poison the tanks and rivers, and the customs of the festival aid in the dissemination of the disease. What further precautions could have been taken? None! And so long as religious teachings compel the use of the unfiltered water of the river, we shall be in danger of these outbreaks.

AN OPEN-AIR SCHOOL FOR MENTALLY DEFECTIVE CHILDREN.

By D. MORLEY MATHIESON, M.A., M.D. (Edin.),
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SINCE the establishment of the Charlottenburg school in 1904, the claims of open air as an adjuvant to, and often a necessary condition for, the adequate education of certain classes of children, have been receiving a steadily increasing recognition. This recognition can hardly fail to lead to a very wide and



A CLASS UNDER THE TREES.

practical application; nor can it be doubted that open-air schools will ultimately be established, not by a few of the more progressive local authorities only, but everywhere throughout the country.

It is possible, too, that teaching under open-air conditions will not always be limited to children who are obviously physically defective: but that attempts may be made to free the ordinary routine elementary education, to some extent, from the present confessedly illogical indoor system, which compels the shutting up in buildings—however well lit and ventilated—of developing children during the best and most health-giving hours of the day.

The following notes deal with an experimental open-air school for mentally defective children held during the summer months of 1908. Instituted by the Norwich Education Authority, it received the sanction of the Board of Education, whose inspector, Dr. Eichholz,

visited the school in the course of the summer. The children selected were those attending one of the special classes for mentally defective; the number on the register being forty-three. The children all belonged to very poor families, and included cases of cretinism, mongolism, hydrocephalus, moral deficiency, etc.

Grounds and Buildings.—The school was held at the Eaton Road Estate, about one-and-a-half miles from the centre of the city. Rooms in a disused boarding-school were made to do duty as dining room, cloak room, kitchen, etc. Proximity to the tramway line made access easy; the children came by tram in the morning and returned at four, half-

price tickets being kindly issued by the tramway company.

The grounds, six acres in extent, were well suited for the purpose; the soil was sandy, and protection from northerly and easterly winds was afforded by sheltering trees and hedges.

The indoor conditions were not so favourable; for example, the room used as a dining room was poorly lighted. But the buildings were occupied at meal times only, except during a fortnight of broken weather in August and September. Even at this time, however, no day was spent entirely indoors.

Daily Routine.—The following is the time table which was originally drawn up:—

TIME TABLE.

9. 0 to 9.15	Arrival of children.
9.15 to 9.30	Lunch.

TIME TABLE.—Continued.

9.30 to 9.55	Religious instruction.
9.55 to 10. 0	Marking registers.
10. 0 to 10.10	Physical Exercise.
10.10 to 10.40	Secular instruction.
10.40 to 11. 0	Free play and organized games.
11. 0 to 11.30	Secular instruction.
11.30 to 12. 0	Ditto.
12. 0 to 12.30	Dinner.
12.30 to 1.30	Rest.
1.30 to 1.45	Wash.
1.45 to 1.55	Breathing & singing exercises.
1.55 to 2.35	Secular instruction.
2.35 to 2.55	Play and organized games.
2.55 to 3.30	Secular instruction.
3.30 to 3.45	Tea and dismissal.

As will be seen, it was intended that an hour's rest (and, if possible, sleep) in deck chairs should be insisted on after dinner; but in practice this was found difficult, and, indeed, impossible to enforce. Mentally defective children are more fidgety and perverse than physical defectives, who take more readily to the after dinner *siesta*. As a result, the time spent in free play, cricket, football, etc., exceeded the forty minutes set apart for them. Swedish drill and breathing exercises occupied twenty minutes, some time being also given to systematic eye movements. The afternoon wash (in a disused coach-house turned temporarily into a lavatory) was a much-appreciated item in the daily routine.

Secular instruction included reading, arithmetic, clay modelling, basket work, paper-folding, and kindergarten games. A period was given each day to nature study, with the surrounding tree and plant and animal life for object-lessons.

It may be noted that boots and stockings were worn by all the children throughout; but these might with advantage have been discarded during school hours in suitable weather.

Meals.—Three meals were provided:—

(1) A lunch of milk with raisin bread on arriving in the morning;

(2) Dinner, consisting of—(a) Monday: Rice pudding, bread, and jam; (b) Tuesday: Shepherd's pie; (c) Wednesday: Cheese and bread, with lemonade; (d) Thursday: Shepherd's Pie; (e) Friday: Fruit and bread, with lemonade;

(3) Tea, consisting of bread and butter or jam, with milk.

About one quarter of the cost of these meals was defrayed by the parents.

(The additional cost of maintenance—that is the cost above the usual cost of the special class—including such items as extra tram fares, food, salaries for housekeeper, etc., and excluding cost of site—worked out at about 30/- per head for the whole period.)

No cod liver oil or similar food was given to the children; and no drugs were administered.

Circumstances Modifying results.—In considering results, the following facts have to be borne in mind:—

1. Out of the four months over which the experiment extended, one month in the middle of the period was taken up by the summer "holidays;" during which time the children (with one exception—a boy who had a week at the seaside) remained at home. As they live in the poorer parts of the city where unsatisfactory and unhealthy home conditions prevail, the break of a month naturally acted as a set-back. Several children lost weight, and many were distinctly less fit after the vacation than before it.

2. Out of the twenty-four hours of each school day, seven only were spent at the open-air school: during the remaining seventeen, the children were back at home. No special arrangement was made with the teaching staff, the hours being as usual 9 to 4. Consequently, it was not possible to extend the time to 6.30 or 7, as is done in some of the schools in Germany and London. Again, on two days in each week school was not held.

This constant return to squalid home surroundings and the back streets of the city, is a serious obstacle to continuous physical and mental progress, from which a residential school is free.

Physical Results.—I examined the children six times in all; at the beginning and end of the open-air period, three times during the period, and finally one month after the return to ordinary school conditions. On each occasion they were very carefully weighed and measured, at a particular hour of the day; the results as regards weight and height being the practical index of physical improvement. In order that they may be easily appreciated, I have arranged them in chart form.

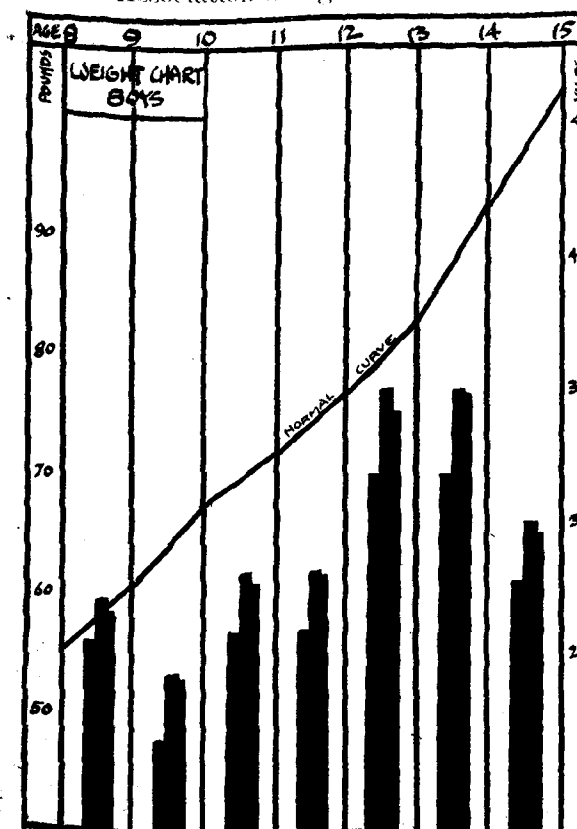


CHILDREN AT PLAY.

A—WEIGHT.

On the two weight charts are shown:

(a) The normal weight curves of average boys and girls at successive ages, the statistics of the Anthropometrical Committee of the British Association being taken as a standard.

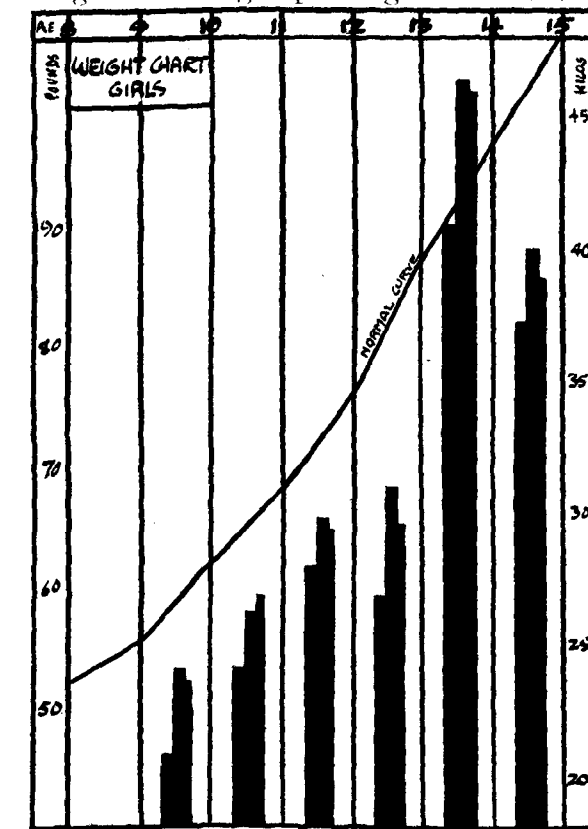


(b) The weight of the mentally defective children in different age groups shown by columns. The first column shows the weight at the beginning of the open air period, the second column the weight at the end of this

period, and the third the weight a month after the return to the old condition of school life.

From the charts it will be seen that:

1. These mentally defective children are in nearly every group below the average weight—several groups being much below.

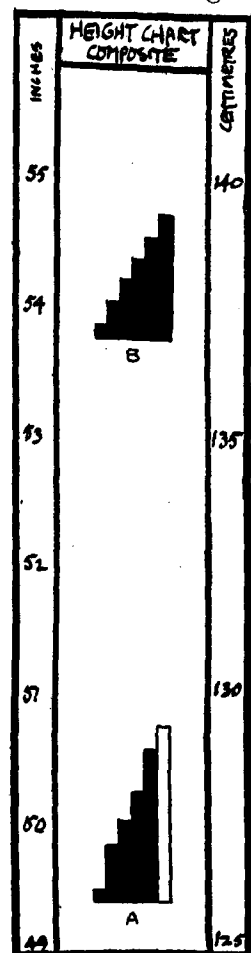


2. In one group on the girls' chart the weight is above the average. This is to be explained by the fact that this group contained only one girl, who was an illustration of the fact that occasionally in cases of mental

deficiency the capacity for physical growth is above normal. It will be seen that this girl's gain in weight was very striking.

3. The gain in weight under the improved conditions is in every group above the average gain of an average child of the same age for a similar period.

4. The gain in weight is not maintained on a return to the old unsatisfactory conditions; instead, an actual loss in weight occurs.



A. Height and growth of the mentally defective children.

B. Calculated height & growth of normal children similarly distributed as to age and sex.

B—HEIGHT.

The height chart is a composite one; it shows:

(a) The average height and average growth month by month of the mentally defective children.

(b) A corresponding average height and average growth worked out for a like number of normal children; similarly distributed in age and sex groups.

From this chart it will be seen that:

1. The mentally defective children averaged 4.4 inches below normal children in height.

2. The gain in height month by month was more rapid than the average gain of normal children, so that, on the last measurement, the children had reduced their deficit to 4.1 inches.

3. The gain in height is maintained even after return to the old conditions. They seem to have received a stimulus to growth the effect of which is felt even after its cause is withdrawn. This is the more important when we consider that any height gain is permanent, whereas a weight gain may be only temporary.

C—GENERAL PHYSICAL IMPROVEMENT.

Corresponding to the increase in weight and stature there was a general raising of the health-level of the children. The respiratory capacity was increased, and there was evidence of improved blood quality—both points of particular importance in children whose mental power is below normal.

During the whole time at the open air school none of the children suffered from colds; in this respect and in the comparative freedom from minor ailments there was a marked improvement, the attendance benefiting in consequence (it averaged 88.3 per cent.)

D—PARTICULAR CASES.

There were many individual features of interest. Two cases only need be quoted:

1. A boy who suffered habitually from headaches was practically free from them while at the special school. Since his return to the old conditions the headaches have reappeared.

2. Another boy, an epileptic, had no fits during school hours at the open air school. The chart shows the number of fits in these and preceding and subsequent months as registered at school.

1	2	3	4	5	6	7	8	NO OF FITS	
								MAY	
								JUNE	
								JULY	
								AUGUST	
								SEPTEMBER	
								OCTOBER	
								NOVEMBER	

The child was not on bromide or other treatment.

Mental and Moral Results.—In these directions very little improvement could be expected in such a short time. The sudden change to

entirely new conditions was necessarily unsettling, making it difficult to enforce discipline as rigidly as is desirable for this class of children, in whose training mental athletics are so essential.

But in certain directions an improvement was noticeable. There was at the end of the period a greater mental alertness, a quicker and more intelligent response to external stimuli. The attention could be longer sustained, probably because of the greater inherent interest of the objects to which attention was directed; and the power of observation, being constantly put to use, was perceptibly strengthened.

As to moral improvement, the effect of communal life was in some degree demonstrated; self-control and sacrifice for the sake of others, being looked upon as "part of the game," come more easily when children live together as a family. And, whether or not we think with Nietzsche that sin is "the moral interpretation of physiological depression," we must at least agree that where the possibility of physical improvement is, there, if anywhere, will the possibility of moral improvement be also.

SMALL BEDROOMS AND THE INLAND REVENUE ACT.—It is no uncommon thing to find in recently-erected houses bedrooms of such tiny dimensions as are represented by a floor area of from 40 to 70 square feet. I have persistently refused to grant certificates of exemption under the Customs and Inland Revenue Acts for houses possessing rooms of such small size. They do not, in my opinion, provide suitable accommodation for the families dwelling in houses where such rooms have to be occupied. The task of refusing these certificates, however, is a thankless one. The houses are built in accordance with the building bye-laws of the council, and the owners not unnaturally feel a grievance when, having complied with the council's requirements, they find they are precluded from the benefits under the Customs and Inland Revenue Acts which would follow but for the withholding of the exemption certificates. The responsibility for this anomalous state of affairs rests, however, in some measure with the Local Government Board. In promoting their Bill of 1903, the council endeavoured to get powers to prevent the erection of houses with rooms having less than a given specified floor area, but in this they were successfully opposed by the Local Government Board. As the granting of the certificates under the Customs and Inland Revenue Acts is entirely within the discretion of the medical officer of health, he is bound to act according to his judgment, and it would be a travesty of all hygienic knowledge to certify that rooms with 40 square feet floor area constituted suitable accommodation for the unfortunate people who have to spend a third of their life in so confined a space.—*Annual Report of Dr. Wm. Butler, Medical Officer of Health, Willesden.*

THE SCHOOL CLINIC AT BRADFORD.

By RALPH H. CROWLEY, M.D., M.R.C.P.,
Medical Superintendent,
Bradford Education Authority.

THE Editor has asked for a short account of the school clinic which has been established here by the education authority, and the following particulars will perhaps prove of interest.

Medical inspection has been carried on in Bradford for a number of years; its possibilities and advantages have been fully recognised, but so have its limits. When the demand came from the Government for further inspection, necessitating an expenditure of considerably more money than had been the case in the past, the committee were very loth to incur this expense unless at the same time steps were taken to ensure treatment, to some extent, at any rate, of defects and diseases found. Previous experience had convinced them how necessary this step was if the money spent for inspection was to yield a satisfactory return.

They accordingly applied to the Board of Education for leave to establish a school clinic for purposes of treatment, and obtained their sanction to deal with the following classes of cases, viz., "minor ailments, such as sores, sore eyes, discharging ears, and ringworm," and for purposes also of "testing the eyesight of children believed to be suffering from defective vision, and for prescribing appropriate spectacles." The committee were given the power of providing in certain cases "appropriate spectacles free of cost, or at a reduced rate." The conditions for the establishment of the clinic, followed the lines laid down in Circular No. 596 of the Board of Education.

The clinic was established at the offices of the education committee, the members of the committee being good enough to give up their "members' room" for the purpose. One or two other rooms also were available, and one of these is now being adapted for the installation of an X-Ray apparatus for the treatment of ringworm.

The clinic is open as follows:—Wednesday and Saturday mornings, 9 a.m., for general purposes, especially for the drug treatment of ringworm, the treatment of sores, and of various skin diseases. Tuesday and Thursday afternoons, 2 p.m., for examination of vision and prescription of spectacles. Monday afternoon, 2 p.m., for the examination and treatment of cases of running ears, and children

with this condition attend also every day at 9 a.m. or 4.30 p.m., for treatment by the school nurse. In addition, at least two afternoons per week will shortly be given to the X-Ray treatment of ringworm, and it seems likely that an additional afternoon will be needed for ear cases. At the commencement of next year the committee will have under consideration the establishment of a dental clinic. It may be added that the clinic is used also for purposes of further medical examination, and children seen in the schools or who are not attending school, and who require such further examination, attend any morning at 9 a.m.

There are at the present time about 350 children on the books for treatment of one kind or another. The clinic has been opened for about six months, and its advantages are unquestionable; children get treated, who, were it not for the school clinic, would remain untreated—that is the outstanding fact. The mother has a comparatively poor chance now of neglecting her child. All cases of ringworm, and all sores, etc., detected by the head teacher, or by the medical staff, or the nurse when visiting, are notified to me, and at the same time a notice is given to the parent stating that she must either take the child to a private practitioner, or to one of the hospitals, or to the school clinic, particulars as to place and time being given. All such cases are visited by the attendance department, and a report is made as to what attention, if any, is being given to the condition, and pressure is brought to bear, and effectively, to ensure one of the above alternatives being carried out. Moreover, visits are paid in cases where it seems necessary to do so, to see that the attention given is regular, and parents who do not attend the clinic upon the days they are told, are also kept up to the mark in the same way.

Children with running ears have, to their serious detriment, been notoriously neglected in the past. It is quite the exception to come across a child systematically and persistently treated for this dangerous condition. Speaking generally, parents will not take their children regularly to a doctor or to a hospital, and this is not to be wondered at, when no provision is made for the daily treatment necessary. The treatment of this condition at the school clinic is most satisfactory.

The establishment of the vision clinic has made it possible for parents to obtain glasses

for their children, who could not otherwise have afforded to do so. The committee invited tenders for the supply of spectacles and parents can obtain them, case included, at the following rates, viz., sphericals 1/5, cylinders 2/-, sphero-cylinders 2/9, and excellent glasses in every way are supplied. The children attend at the opticians, of course, to be fitted, but they have to call at the clinic for the glasses, so that the doctor who prescribed them may see that they are satisfactory. An investigation I made a year or two ago into a large number of cases showed that the average price paid was 6/- (excluding those glasses where high prices were paid for fancy frames). All payments are made to the committee direct, and if the parent alleges inability to pay, investigation is made into the circumstances of the family, and should these warrant such a course, the cost is remitted.

The vast majority of cases of eye and ear defect or disease which present themselves at the school clinic, are, of course, simple cases, capable of being dealt with by any well qualified medical man or woman who has paid some special attention to these conditions; they do not need the treatment of a "specialist." Cases, however, of disease, whether of eye or ear, necessitating expert advice or treatment, are referred to one of the senior surgeons at the Eye and Ear Hospital, who very kindly deal with such cases and forward a report, where necessary, in the same way that they would do should a child be sent up to them by a private practitioner.

The outstanding advantage of the school clinic is that it connects up so intimately medical inspection and treatment. Cases which are classified as "uninteresting" at the out-patient department, and which no one troubles to follow up, are of special concern to the school medical officer, and he has the necessary machinery to hand to see that they are not neglected. The school clinic adds also very greatly to the interest of the work; inspection alone, year in and year out is almost intolerable, and there can be no doubt that where inspection and treatment are combined, work of the greatest interest is offered, and of such a nature, as to tempt the best men and women of our profession to enter the public health service. It is such we want, and to this category belong, I should like to add, my two assistants, Dr. Lewis Williams and Dr. Margaret Dobson, upon whose shoulders falls so much of the actual work detailed above.

THE MEDICAL TREATMENT OF SCHOOL CHILDREN IN LONDON.

THE Education Committee of the London County Council have recently had before them the report of their special Sub-Committee, appointed to consider the question of the medical treatment of children attending public elementary schools. The sub-committee consisted of thirteen members of the Education Committee and the following representatives of outside institutions:—Mr. Norman G. Bennett (Bristol Dental Association), Sir Victor Horsley (British Medical Association), Dr. Sidney Phillips (Central Hospital Council for London), Dr. Charles Gray (Charity Organisation Society), Lord Cheylesmore (Metropolitan Hospital Sunday Fund), Mr. Douglas Owen (London Hospital), Mr. R. J. Bland (Royal London Ophthalmic Hospital), Dr. H. Morley Fletcher (St. Bartholomew's Hospital). In the terms of reference the sub-committee were required to make inquiries upon the following points:—

(i.) What is the existing provision for the medical treatment of school children?

(ii.) To what extent can this provision be rendered more available by the action (a) of the hospitals (b) of the Council?

(iii.) What additional provision, if any, is desirable?

(iv.) How should this provision be supplied?

In making their inquiries the committee collected a mass of valuable information which is summarised in the appendices to their report. Information was sought from 198 hospitals, dispensaries and kindred institutions in the metropolis; witnesses were examined and special memoranda were prepared. The committee, moreover, had the advantage of utilising the results of the laborious investigations of Dr. Kerr and his staff. The report, with its appendices, forms a document of great importance which is well worth careful study.

The committee answer the first three questions addressed to them as follows:—

(i.) "Such facilities as exist for the medical treatment of school children are provided by hospitals, dispensaries, infirmaries, etc., and the general practitioner.

(ii.) Many of the above-mentioned institutions with their existing accommodation can do no more so far as the treatment of the cases indicated is concerned. Some could do more if assisted from public funds; others could do no more whether assisted or not.

(iii.) We think that, generally, sufficient accommodation exists to deal with the grave cases that require operative treatment. On the other hand, as regards the more ordinary ailments of children, a large amount of routine work is necessary, the provision for which is inadequate and in many parts of the country non-existent."

The committee then submit detailed findings with regard to teeth, vision, ringworm, favus,

suppurating ears and adenoids, debility and tuberculosis, and they answer question (iv.) at some length as follows:—

"In answer to question (iv.), namely, how should medical treatment be provided for children found on inspection to be defective, attention must first be given to the nature of the conditions to be dealt with. It should be understood that for certain cases of mental and physical deficiency, education under special conditions is already provided by the Council.

It would appear that the children attending the elementary schools maintained by the Council, who require medical treatment, may be divided into three classes:—

Class 1.—Those requiring care in an institution and out-door life, i.e., (a) debilitated children; (b) children convalescent from tuberculosis treated surgically; (c) children suffering from subacute or early tubercular disease.

Class 2.—Those requiring operative and in-patient treatment.

Class 3.—Those who can be promptly and adequately dealt with in suitably equipped rooms, e.g., children suffering from teeth defects and simple diseases, eye defects and simple diseases, skin diseases (chiefly parasitic, e.g., ringworm, scabies, pediculosis, etc.), ear defects and simple diseases.

The provision necessary for each of these classes must now be considered in detail.

Class 1.—As already stated, a large number of children in this class can only be effectively treated by segregation in institutions intermediate between the hospital and the special schools situated in the country, but in order adequately to provide for these children, whose physical debilitation and deterioration constitutes a grave national danger, a number of residential schools will be necessary.

Class 2.—The relatively small number of children belonging to this class will leave or be excluded from school, and be referred for treatment at home by private practitioners or for in-patient or operative hospital treatment.

Class 3.—In this class are collected the very large mass of cases revealed by medical inspection, namely, physical deficiencies, which can be readily and economically treated if dealt with together at suitable centres conveniently situated in regard to the schools.

Two distinct propositions have been considered by the committee:—

(1.) That the Council should make arrangements with the existing hospitals and dispensaries.

(2.) That the Council should establish school surgeries or clinics at which treatment should be provided by its own medical officers.

Both propositions are alike in that the cost of dealing with the deficiencies enumerated above

is to be provided out of the education rate. It only remains for the committee to report on the relative efficiency and economy of the two proposals.

(1) *Efficiency.*—The committee find that the hospitals in the metropolitan area not only are concentrated in those areas in which there are fewest schools, but, further, that the special accommodation in their buildings is in many cases inadequate or cannot be extended.

The committee find that at the present time the dispensaries in the metropolis are few in number, are not as a rule situated conveniently for the schools, or provided with suitable or adequate accommodation; and finally that in various large areas (e.g., one district in S.E. London, with a population of 300,000) there are no dispensaries. Mr. Charles H. Warren, the secretary to the Metropolitan Provident Medical Association, and Mr. T. Hancock Nunn, of the Council of Social Welfare at Hampstead, who gave evidence to the committee, urged that the Council should grant financial aid to the organizations they represented. Mr. Nunn suggested that if the Council decided to aid the existing hospitals and dispensaries, no further public provision of medical treatment of children attending the London schools will be necessary. We are, however, informed that neither the provident dispensaries described by Mr. Warren nor the friendly societies referred to by Mr. Nunn at present deal with the greatest and most difficult part of the problem, namely, the treatment of the teeth, eyes, suppurating ears and other conditions which require continuous and skilled care and attention. Such cases were, we were told, dealt with by obtaining hospital "letters" for the patients.

The essence of the provident dispensary system consists in a small periodic contribution by the parents, but no method was put before us by which the Council could, under the existing law, enforce general and regular payment of such contributions. To effect this, an important change in the law would be required, and, moreover, the experience gained during the legal exaction of school fees from 1870 to 1891 shows that payments of that kind, even when sanctioned both by law and custom, are difficult and expensive to collect. If, on the other hand, the suggested system of provident payments remained voluntary, the education authority would have to discriminate in its treatment between children suffering from similar disabilities according as they had or had not made voluntary payments in the past.

Treatment through any dispensaries must either be given at the residence of the medical practitioners who are dispensary officers, or on the premises specially provided. If the first system, which we are informed is the present ordinary practice, is adopted, and if the parents are further required to accompany their children, not only will it be difficult to secure premises sufficiently suitable to be approved by the Board of Education, but a serious waste of time and wages, involving constant difficulty and friction, must result, and would probably militate very seriously against the

children receiving the treatment they would require. If new and specially equipped premises are to be provided for the dispensaries, the costs must be borne by the Council, and is not likely to be less than that which would be entailed by the provision of similar premises under the direction of the Council itself.

The school dental clinics set up in Brussels, Wiesbaden, Darmstadt, Mulhausen and Strasburg, we are informed, have proved successful.

It is clear, therefore, that the hospitals and provident dispensaries of the metropolis cannot adequately provide the treatment required, and even if such service were attempted, the efficiency, i.e., the time and care given to children at any of the charitable or provident institutions referred to when both adults and children attend, would be less than that provided in a school surgery or clinic designed and equipped for the special needs of the school children. Such surgery or clinic could be established in a house selected as being in the centre of a group of schools, and to which the children could be brought with the maximum convenience and saving of time. The treatment in such a school clinic would be furnished by school medical officers under the immediate direction of the Council.

We may observe, in conclusion, that the provident dispensary system would remain unaffected by the foregoing considerations except so far as concerns children of school age suffering from the particular affections herein referred to.

(2) *Economy.*—Although the question of payment to existing institutions is necessarily surpassed by the considerations just detailed, it must receive further discussion. Such payment would, as a rule, cover two sources of expenditure; the cost of accommodation and equipment on the one hand, and on the other the cost of skilled attendance.

The committee has not received any estimate of such expenditure, and therefore cannot institute accurate comparisons, but payments to institutions and departments founded for other purposes probably would not offer such returns as money expended in the maintenance of a school surgery or clinic arranged and reserved for the direct purpose of treating the defects of the children referred.

It must also be evident that the indefinite series of payments to a large number of separate institutions, and the endless adjustments and assessments of payments to the medical staffs of these institutions involved by such a system can only result in inextricable financial confusion and possibly extravagance, whereas the administration of school clinics by the education authority can be financed with accuracy and economy.

The proposal that the State should subsidise from public funds charitable medical institutions in order to create a claim on the benefits of such hospitals or dispensaries for children or persons under State authority, educational or poor law, raises a new and serious question of principle. The representative meeting of the British Medical Association has already fully considered this

question, and is resisting the proposal on the ground that any State medical service must be adequately organized, must be administered on a systematic basis, and must be clearly distinguished from work undertaken for charitable motives.

RECOMMENDATIONS.

(a) That, as the existing provisions of private and hospital practice sufficiently meets the requirements in the case of children requiring operative and in-patient treatment (who are thus removed from the direct purview of the educational authority), no further steps be taken in respect of this class.

(b) That the Council should establish school clinics at suitable centres in the metropolis for the medical treatment of the defects included in Class 3."

THE SIGNIFICANCE OF A LOW BIRTH-RATE.—However much we may deplore a low birth-rate, it is obviously the outcome of economic forces and social habits, over which a sanitary authority can little hope to exercise any controlling influence—at least, any direct controlling influence, and I would again point out that a sanitary authority can best meet this low birth-rate and neutralise to a great extent its untoward effect on the population, by adopting every measure in its power to diminish the infantile death-rate, and to secure an improved physique amongst the children that survive. It is indeed questionable whether a high birth-rate is in itself advantageous to the community, inasmuch as it is almost invariably associated with a heavy mortality in infancy and during the first few years of life. At the rate of mortality in the year of our highest birth-rate (1874) there were 810 survivors at the end of 5 years, out of the 1,170 children born in that year. At the rate of mortality in 1907, there should be 830 survivors out of the 1,025 children born that year. But to make the comparisons more accurate, we must relate the rates to the respective populations. In 1874, with a birth-rate of 40 per 1,000, the death-rate during the first 5 years of life was 12.5 per 1,000 of the population. In 1907, with a birth-rate of 23.6 per 1,000, the death-rate during the first 5 years of life is 4.5 per 1,000. If the birth-rate and the 0-5 years death-rate of 1874 had prevailed in 1907, we should have had 1,731 births and 541 deaths under 5 years of life, giving a surplus of 1,190, as compared with 1,025 births, 195 deaths under five years of age, and a surplus of 830, the actual figures occurring. In 1907, with a birth-rate of 30, and the same death-rate, as did occur, we should have nearly as high a surplus as we should have had with a birth-rate of 40 per 1,000, and a child mortality similar to that of 1874. It seems fairly clear that a moderate birth-rate with a low child mortality, may do as much towards the upkeep of the population as a high birth-rate associated with a high child mortality.—*Annual Report of Dr. Thomas Gibson, Medical Officer of Health, Wakefield*

AN OUTBREAK OF MILK-BORNE DIPHTHERIA DUE TO CARRIER CASES.

IN the July number of the *Australasian Medical Gazette*, there is an interesting account of a diphtheria outbreak in the western suburbs of Sydney, by Dr. W. G. Armstrong, Medical Officer of Health, of the Metropolitan Combined Districts, Sydney. Dr. Armstrong concludes that the milk that disseminated the disease was infected by persons who, though not themselves suffering from diphtheria, yet harboured the bacillus of diphtheria within their throats. Dr. Armstrong summarises the main facts of the outbreak as follows:—

1. Between January 1st and February 14th, 1908, in the municipalities of Ashfield, Enfield, Burwood, Concord, and Strathfield, with a combined population of, approximately, 36,000 persons, only three cases of diphtheria were notified

2. Between February 14th and March 9th, 40 cases of diphtheria were notified in the same districts, of which thirty-four were among persons using the milk of two dairies, S.M.'s and A.B.'s. No other circumstances than that of a common milk supply connected the persons affected.

3. On February 15th, a man named A.M., who had on the previous day suffered slightly from sore throat, accompanied by swollen glands in the neck, was taken into S.M.'s employ to milk and distribute the milk.

4. On February 16th, two persons among S.M.'s customers sickened with diphtheria, and from that date until February 28th fresh cases of diphtheria occurred almost daily among the customers: On February 28th the outbreak ceased.

5. On February 26th, the milker above-named, A.M., and one other person on S.M.'s dairy were found to be harbouring Klebs-Loeffler bacilli in their throats; and on February 27th, five other persons residing on the same dairy premises were found to be harbouring Klebs-Loeffler bacilli in their throats. None of these persons were appreciably indisposed, but a culture of the organisms from A.M.'s throat was reported from the laboratory to have proved virulent to guinea-pigs.

6. On February 22nd, George P., a milker employed by S.M., left the latter's employment, and went to work as a milker on A.B.'s dairy. He had been specially associated with A.M. while at the former dairy.

7. On February 26th, a case of diphtheria occurred among A.B.'s customers, and a total number of five cases occurred among the customers of this dairy between February 26th and March 5th.

8. On February 28th, George P. left A.B.'s dairy and returned to S.M.'s dairy in the same capacity of milker and milk distributor.

9. On March 3rd, George P. was found to be harbouring Klebs-Loeffler bacilli in his throat, and was excluded from S.M.'s dairy.

10. On March 5th, a fresh outbreak of diphtheria began among S.M.'s customers, and affected four persons,

11. A consideration of the circumstances set forth in this report leads inevitably to the conclusion that the man A.M., while harbouring the organisms of diphtheria in his throat, though not, apparently, ill, came to S.M.'s dairy, and infected the throats of most of the persons on that dairy, including George P. None of these persons became ill themselves, but the bacilli which they harboured in their throats were virulent, and, getting into the milk supply, caused an outbreak of clinical diphtheria among the customers of the dairy. Subsequently, George P. went to A.B.'s dairy, among the customers of which a small outbreak occurred, which ceased on his leaving that dairy. On the return of George P. to S.M.'s dairy, he relit the flame which had been extinguished by the removal from that dairy of the source of infection, and caused a small fresh outbreak among S.M.'s customers before he was also removed, owing to the prompt detection of the condition of his throat.

12. In none of the households affected was the domestic milk supply invariably scalded before consumption.

WOOLSORTING REGULATIONS—KEIGHLEY MANUFACTURER FINED FOR STORING BALES IN THE SORTING ROOM.—At the Keighley Police Court, on November 3rd, a local manufacturer was charged, at the instance of W. H. Seal, factory inspector, with sorting wool in contravention of regulations. Mr. G. M. Robinson, jun., appeared for the defendant. Mr. P. A. Heath, factory inspector, who prosecuted in place of Mr. Seal, said the defendant was the occupier of a factory in which the process of wool washing, sorting, and combing were carried on. These regulations applied to this factory. Regulation 6 stated that no bale of wool or hair should be stored in a sorting-room, except in a place screened off from the sorting-room, and it had been found on frequent occasions that that regulation had not been carried out at this factory. One of the firm had been personally cautioned, and so far back as October last year a letter of caution was sent to him, pointing out different things which were not in compliance with regulations. Going into the witness box, Mr. Heath said that on October 8th he found that in the sorting-room No. 4 at the works, in which the process of sorting mohair was being carried on, there were about 250 bales, some of which were English wool and some mohair. He was informed by the firm that some of the bales, of different wools, had been there for six or twelve months. He had on previous visits drawn the attention of the firm to this fact, that the room was being wrongfully used, and pointed out the regulation to them. On July 4th of last year, nearly eighteen months ago, he pointed out that there were bales of wool stored in the same room, and alpaca was then being sorted there. In October of last year Mr. Seal wrote to the defendant and pointed it out to him. Nothing had been done in the matter, bales being still stored there. A fine of £5 and costs was imposed, the Mayor remarking that the Bench did not think there had been the slightest danger to human life. It was simply a technical offence.

THE OCCUPATION OF UNDERGROUND ROOMS AS WORKMEN'S DWELLINGS.

(From the Annual Report of the Mansion House Council on the Dwellings of the Poor, for the year ending June 30th, 1908.)

THE experience of the Mansion House Council on the Dwellings of the Poor, derived from its study of the housing of the poor in London and the reports of its officers and inspectors and local committees, leads it to the conclusion that in the interests of public health and welfare amendments are much needed in the law relating to underground dwellings, and this opinion is, it is believed, supported by some experienced medical officers of health.*

A good deal has been done in the various districts of London to put an end to illegal occupation of underground rooms, and in some boroughs enforcement of the law directly dealing with this subject has been supplemented by proceedings for closing certain classes of underground rooms as unfit for habitation.†

During the last fifty years' great progress has been made in dealing with cellar dwellings and underground habitations. The mischief attending the occupation of such dwellings was apparent when the Public Health Acts were first enacted in 1848. In Jephson's "Sanitary Evolution of London" the evils then existing in London are startlingly set forth.

LEGISLATION ON THE SUBJECT.

At the present time, laws in force applying to various parts of the United Kingdom prevent or limit the use of cellars and underground rooms as dwelling places.

In England, outside London, the subject is governed by sections 71-75 of the Public Health Act, 1875, which apply to London over the border, and in Ireland are governed by the Public Health Ireland Act, 1878, sections, 82-86, which are in substance the same as the English sections.

In London itself the occupation of underground rooms is regulated by sections 96-98 of the Public Health London Act, 1891, and their construction for habitation by section 70 of the London Building Act, 1894.

The most recent public enactments on the subject are those contained in section 74-76 of the Public Health Scotland Act, 1897 (60 and 61 V., c. 38). These clauses seem to have been drawn mainly in reference to the peculiar circumstances of building in Scotland and particularly in Edinburgh, where it is not uncommon to have the road below the floor level at the front and up to or above the ceiling at the back and other buildings abutting at the sides. This gives only one open side, and this condition arises from the steepness of the ground on which some parts of the city have been built and by alterations made in street levels to suit altered conditions of traffic.

* e.g., Dr. Sykes of St. Pancras. See his Annual Report, 1906.

† e.g., in Woolwich under section 2 of Public Health London Act, 1891, whether rooms let conjointly or separately.

The sanitary authorities in Scotland try to discountenance the occupation of such houses and condemn as many as the terms of the Act will allow, and in no new buildings would such unhealthy conditions be tolerated as obtained in bygone times or as are even now admissible under the minimum requirements of the Scotch Public Health Act.

LONDON.

In houses built before 1856 in London there was no minimum height for an underground dwelling room. From 1856 to 1895 the minimum height was 7 ft., which was adopted in the Public Health London Act, 1891. Under the London Building Act, 1894, the minimum height of a basement dwelling room built since January 1st, 1895, is 8 ft. 6 in., and in the Scotch Public Health Act, 1897, the minimum height is 9 ft.

Under the laws applying to London, an underground room 7 ft. high, can be legally occupied as a separate dwelling if it satisfies the other conditions of section 96 of the Public Health Land Act, 1891, and even when it cannot be legally occupied as a separate dwelling it can be jointly occupied with other rooms under such conditions as to make it extremely difficult for the sanitary authorities to detect the illegality.

An underground room, not more than 7 ft. high, is in few cases fit for occupation as a living room at all; and it is unfortunate that so low a standard as 7 ft. was adopted in 1891 for rooms to be newly occupied as dwellings.

The existing legislation gives the local authorities certain dispensing powers. These enable them to permit habitation either absolutely or for a limited period of underground rooms which were occupied as separate dwellings on August 5th, 1891, and to relax for this purpose the conditions applied to underground rooms not so occupied until after that date. The result of this is that such rooms in old buildings and even rooms built before 1855 may be used as the dwellings of the poor.

At the present time, in the poorer districts of London, many underground rooms are used for both living and sleeping purposes, although in the same districts there are numerous houses unoccupied.

The rooms in question are the cheapest available, and in the Eastern boroughs are occupied by the poorest and most helpless classes of the people.

Defective lighting makes it difficult to clean a room thoroughly; while darkness, dampness, and the absence of ventilation combine to produce conditions favourable to the growth of tubercle and other noxious bacilli. It would also appear that eye disease is caused by the insufficient light, and that disease and pulmonary complaints are common among occupants of underground rooms. Proper ventilation in such rooms is difficult, because to open the windows at the bottom lets in street refuse. Few windows open at the top, and still fewer are opened because of the draught which would be caused.

Such rooms are not generally used as work-

rooms because of lack of light, except in trades such as shoe making, relegated because of noise to the basement.

The present law making separate occupation as a dwelling the test of illegality is evaded either by occupying a back basement room, which is not technically underground, or by taking the basement in conjunction with another room on a higher floor which may be used as a workroom, with the result, in some instances, that the basement rooms are used for sleeping purposes in the absence of adequate provision to the contrary.

This provision as to separate occupation, whatever its value in houses occupied by one family,* is mischievous in districts where the houses are let out in tenements and occupied by a number of families, and the law as it stands must prejudicially affect the health of the adults and children who occupy such places.

Moreover, apart from the effects of the rule as to separate occupation as a dwelling, the definition of underground room does not affect many basement rooms which are quite unfit for use except as storerooms or the like, but, on the other hand, it does affect basement rooms which are quite habitable. Moreover, the dispensing power of the local authorities, where exercised, is not subject to any definite and sanitary standard.

The points in respect of which it seems desirable to amend the law are:—

(1.) The abolition of the separate occupation provision, or, if that be found impossible, a more definite and more stringent qualification.

(2.) The elimination of the dispensing power of the sanitary authority with some provision for safeguarding rooms which, while technically not in accordance with the Act, are not unfit for habitation.†

(3.) Some provision bringing within the reach of the law basement rooms of such a character as to be unfit for human habitation within the scope of the Act, even though they do not fall within the definition of underground rooms.

The most feasible method of carrying out the desired improvement in the law which at present suggests itself to this Council is to substitute for the power of dispensation a system of renewable certificate to be granted by reference to a standard of habitableness to be laid down for all houses in London or for prescribed classes of houses, e.g., those occupied by several families.

The nearest precedent is that afforded by the provisions of the Factory Act, 1901 (section 101), as to underground bakehouses, which has wiped out the irremediably bad bakehouses and led to

* There are not a few basement bedrooms occupied by servants in good houses which are unfit for use as sleeping rooms.

† There must be many thousands of basement rooms in London the ceilings of which are at, or a few inches below, the street level, but which cannot possibly be regarded as unfit for habitation; but the effect of unqualified elimination of the dispensing power under section 96, sub-section 3, would be to render the occupation of such rooms as dwellings illegal. The level of roadways tends to rise with repairs, and by the gradual rise, of course, the roadway may in time become above the ceiling level of basements.

great and necessary improvement of those which are still permitted to be used. Whether the certificate should be given by the medical officer or by the local authority is a matter of opinion, but in view of the number of such rooms time would be saved and a steady system would be better secured by giving the power to the medical officer subject to the Local Government Board standard and to review by a magistrate or by the Local Government Board.

PROSECUTIONS UNDER THE NOTIFICATION OF BIRTHS ACT AT MIDDLESBOROUGH.—The Act was adopted by the Middlesborough Council in January last, and came into force on Feb. 14th. Notice was given in accordance with the Act by public advertisement in the local newspaper, by large and prominent bills posted all over the borough, by written notices to the medical practitioners and all known midwives, whether registered or not. In addition, private communications were sent to the whole of the medical practitioners explaining the scope of the Act and giving in detail the methods that would be adopted in carrying it out. From time to time medical men have been reminded of the fact that all notifications were not being received, and as it was found that about 10 per cent. of the births were not being notified, the medical officer of health suggested that the best method of bringing the Act into prominence would be to take some of the cases into Court. Summonses were issued against all the fathers who had registered births with the Registrar during the month of August, and who had failed to notify the same—the father being the first person named in the Act as being responsible for the notification. Six of these summonses were not served, the parents having left the address at which the birth was stated to have taken place; twenty-seven were ordered by the stipendiary magistrate to pay 10s. toward the costs; two were ordered to pay 5s. toward the costs, and one to pay 2s. 6d. toward the costs, time in which to pay being granted where it was asked for, as most of the people were poor, the last-mentioned being in receipt of parish relief. In opening the case the solicitor for the prosecution made it quite clear that the Corporation were not asking for any fine, but were only taking the cases to give emphasis to the fact that the Act having been adopted, it must be duly carried out. Ten of the cases were either withdrawn or dismissed for the following reasons. In one case the mother of the child had not been living with her husband for some years, yet had registered the child in his name. In others the father was not present in the house at the time of the birth, some being away at sea. Others convinced the magistrate that they had good reason to believe the birth had been notified by either the medical attendant or midwife. It was proved in several cases that the medical attendant had stated he would notify the birth but had failed to do so, and in such cases the magistrate declared that further summonses should be issued against these medical men.

REVIEWS.

HEREDITY. By Professor J. Arthur Thomson. John Murray. 9s. net.

The importance of heredity as a factor in the production of disease, is still a matter upon which there is much diversity of opinion. Striking evidence of this fact will be found in the recent discussion at the Royal Society of Medicine. Some years ago it was the fashion to explain many diseases by asserting that they "ran in the family," but with the development of bacteriology there came an increasing tendency to minimise the importance of heredity as an etiological factor. At the present time, however, chiefly owing to the influence of Professor Karl Pearson, heredity seems to be coming up again, and in pathological discussions increasing use is made of the blessed word "diathesis." The public health worker is under a special obligation to inform himself on the subject of heredity, if only that he may acquire intellectual ammunition to repel the common accusation that his work in some mysterious way interferes with the "survival of the fittest." Of late years, however, the labours of the students of heredity, especially the Mendelians and the statisticians, have produced an enormous increase in the literature of the subject, and the ordinary busy professional man finds it extremely difficult to keep up with these modern developments. But Professor Thomson's book will enable him to get over this difficulty. He will find in it an admirable exposition of what it is important to know about heredity, which is thorough and accurate, and at the same time eminently readable and attractive. Professor Thomson discusses the problems of heredity in the light, such as it is, of the most modern discoveries, and while avoiding dogmatism on the one hand, he does not adopt the equally objectionable course, too common in writings of this kind, of merely stating the facts and leaving the reader without guidance as to the right interpretation of the facts and the conclusions that may legitimately be drawn from them. His account, for instance, of the question of the inheritance of acquired characters is strictly impartial, but he does not conceal his own conviction "that we do not know of any instance of the transmission of an acquired character." There is a valuable chapter on heredity and disease, and admirably lucid explanations are given of the statistical study of inheritance, and of the chief facts relating to the work of Mendel and his followers. The book is one of great interest and importance, and we strongly recommend it to our readers.

LUMLEY'S PUBLIC HEALTH ACTS. Seventh edition. Edited by Alex. Macmorran, K.C., and Joshua Scholefield. Butterworth and Co.

"Lumley" must now be regarded as one of our public health institutions, and the seventh edition, a copy of which has been added to the library of the Society of Medical Officers of Health, has been thoroughly revised, and contains the Acts affecting

public health that were passed in 1907. The collection of Orders of the Local Government Board and other Government departments has also been brought up-to-date. The present edition contains a large number of new leading cases, there being no less than six hundred new cases in Vol. I. alone, and the dates of the cases have now been given—a material addition to the usefulness of the book. The notes have been revised, and, in part, re-written. They include notes on the practice of the Local Government Board in relation to the administration of public health law, and the views of the Board are given on many of the difficult provisions of the various Acts. The present edition is certainly more bulky than former editions, but the editors have taken pains to make it easy for the inquirer to find his way about, and the book has lost nothing of its value as a ready work of reference. The seventh edition of Lumley's Public Health Acts, like its predecessors, will no doubt find its way into the library of every well-equipped public health administrator.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

North-Western Branch.—A Meeting of the North-Western Branch was held at the Victoria Hotel, Manchester, on Friday, November 27th, 1908. *Present:* Dr. W. M. Hamilton (in the chair), Drs. Wheatley, Peck, Wilkinson, Sergeant, Daley, Wood, Buckley, Rees Jones, Hibbert, Hutchinson, Linton, Arnold, Carnwath, Garstang, Brindley, Barlow, Harris, Marsden, and Hutt.

Minutes of last meeting were read, confirmed and adopted.

ELECTION OF MEMBERS.

Dr. James Wood, Assistant Medical Officer of Health, Oldham; Dr. Lucy Pinniger, Assistant Medical Officer of Health, Oldham; Dr. Sydney Marsden, Medical Officer of Health, Birkenhead; Dr. Rees Jones, Medical Officer of Health, Blackpool, were duly elected Members of the Branch.

NOMINATIONS.

Dr. Henry, of Rochdale, and Dr. Burnet, Medical Officer of Health, Bury, were nominated for election.

COUNCIL MEETING.

Secretary reported on the Council Meeting held in London on the 13th November.

PAPER.

Dr. Fowler read a most interesting Paper entitled "The Fifth Report of the Royal Commission on Sewage Disposal: An Impression."*

*This Paper will appear in a subsequent number of PUBLIC HEALTH.

In the discussion which followed, Drs. Sergeant, Wilkinson, Wheatley, Carnwath, Peck and Mr. Arden (visitor) took part.

A hearty vote of thanks was unanimously accorded to Dr. Fowler at the close of the proceedings.

ANNUAL DINNER.

The Annual Dinner of the Branch was held in the evening, at which forty-six were present. The guests of the Society were Sir William Sinclair (Member of the Midwives' Board), the Chairman of the Lancashire County Council; Mr. Stent (President of the Veterinary Association of Manchester), and the President and Secretary of the Chemical Club.

The Lord Mayors of Liverpool and Manchester, the President of the Liverpool Medical Institution, and the Vice-Chancellor of Manchester University found themselves unable to attend.

Yorkshire Branch.—A Meeting was held at the Town Hall, Halifax, on Wednesday, the 9th December, 1908. There were present Dr. Neech (Halifax) who occupied the chair, Drs. Adam (Wakefield), Anderson (Wortley), Adams (Sowerby Bridge), Bampton (Ilkley), Clements (Batley), Davidson (Hipperholme), Fry (Sowerby Bridge), Jackson (Denholme), Lambert (Farsley), Martin (Brighouse), Milne (Mirfield), Orr (Wakefield), Robinson (Wakefield), Scatterty (Keighley), Stedman (Selby), Sutherland (Cleckheaton), Wellburn (Sowerby Bridge) and J. R. Kaye (Wakefield) the Honorary Secretary. Several visitors were also present, including Dr. Dora Mann and Alderman Hay, the Chairman of the Halifax Health Committee.

At the Meeting of the Council the Honorary Secretary drew attention to the public meeting to be held in Leeds on the 11th December, with the view of forming a County Nursing Association. He also reported that, with the approval of the President, he had invited the Society to hold its Provincial Meeting next year in Yorkshire.

The members then drove to inspect the Battinson Road Schools, which are quite up-to-date, and possess on the site, in addition to the ordinary school accommodation, some very fine baths and cookery rooms. The Plenum system of ventilation, installed here, was fully considered.

On returning to the town hall the members were welcomed by the mayor (Mr. Councillor F. Whitley Thompson) in the council chamber. In alluding to the declining birth-rate the mayor said some people were hopeful that the Chancellor of the Exchequer would do something to encourage an increase of the population, but whether this would take the form of taxing the bachelors (laughter) or giving a premium to large families, he did not know. He drew attention to the very favourable condition of the vital statistics as evidence of the healthiness of the town of Halifax, and of the good work carried out in past years by the Health Committee.

Dr. Neech then delivered his Presidential address on "A Consideration of some of the Factors which operate in the Causation and Spread of Scarlet Fever."* Dr. Neech was very

*This Paper will appear in a subsequent number of PUBLIC HEALTH.

cordially thanked for his able and exhaustive address, and it was observed that it would be well to discuss some of the points raised by him at a subsequent meeting.

The election of seventeen new members then followed.

After the meeting substantial refreshments were provided by the kindness of the mayor (the mayoress and her daughter, with Mrs. Neech, presiding at the table), who was heartily thanked for his hospitality, and responded in a genial speech in which he remarked that our highest aim was embodied in the phrase *mens sana in corpore sano*.

Midland Branch.—A meeting of this Branch was held on December 3rd, 1908, at the Council House, Birmingham, at 3.30 p.m. *Present:*—Drs. Reginald Green (President), Ridley Bailey, Malet, Bostock Hill, J. Orton, F. H. May, Sisam, Henry May, Helena Jones, J. G. Beasley, Robertson, Handford, Manley and Snell.

The Minutes of the last meeting were read, confirmed and signed. Dr. Henry Handford read a paper on "Monthly Nurse or Midwife." A discussion followed, which was joined in by Drs. Bostock Hill, Robertson, Malet, J. Orton and Garrett, and Dr. Handford replied.

Dr. Garrett read a Paper on the "Conversion of Old Cowsheds,"* illustrated by photographs; in the subsequent discussion the following participated: Drs. Bostock Hill, Robertson, Snell and the President, and Dr. Garrett replied.

Home Counties Branch.—The second meeting of the Session was held on Thursday, November 19th, 1908. The Hon. Secretary reported that he had sent to all members an abstract of the new "Articles of Association" for their information and guidance. Dr. A. E. Porter, Medical Officer of Health for Reigate Borough and Rural District, then read a Paper on "The Water Supply of Dairy Farms." The subject was considered from a hygiene, bacteriological and chemical point of view, and an associate, Mr. Droop Richmond, F.I.C., opened the discussion following this Paper with an interesting contribution on the subject.

The third meeting of the Session took place on Thursday, December 17th, 1908, when Dr. Meredith Richards, Medical Officer of Health of Croydon, presented "Notes on the Preparation of the School Medical Officer's Annual Report to his Education Committee." The prospect of receiving some timely information from one who has had some years' experience of the medical inspection of school children, attracted a large audience which included the medical officers of health for the counties of Herefordshire, Berkshire, Kent and Northants. Drs. Tate, Porter, Cane, Sanders, Butler, and Miss Martha Adams also made enquiries of Dr. Richards, and joined in the animated discussion.

The fourth meeting will take place on Thursday, January 21st, to hear a short Paper by Dr. Nash, County Medical Officer of Health for Norfolk, on "Insects as Carriers of Disease."

*This Address will appear in a subsequent number of PUBLIC HEALTH.

THE LIBRARY.

All Books and Publications received by the Editor and by the Hon. Librarian will be acknowledged under this heading.

Journals.

The Polyclinic. Tropical Medicine and Hygiene. All-India Hospital Assistants' Journal. Australasian Medical Gazette. Sanitary Record. Transvaal Medical Journal. Hospital. Glasgow Medical Journal. Journal of the Royal Sanitary Institute. Registrar-General's Weekly Returns. The Military Surgeon. Pacific Medical Journal. Social Review. Indian Public Health. Medical Times. Circular of the County Councils Associations. British Food Journal. Giornale della Reale Società Italiana d'Igiene. Journal of the R.A.M.C. American Journal of the Medical Sciences. Canadian Nurse. Journal d'Hygiène. Medical Review of Reviews. Lancet. British Medical Journal. Birmingham Medical Review. Water. Sanitary Journal. Bristol Medico-Chirurgical Journal. Annali d'Igiene Sperimentale. Canadian Practitioner and Review.

Annual and Other Reports.

Annual Report of the New Zealand Public Health Department. Report of the M.O.H. and the Sanitary Inspector for October, 1908. City of Aberdeen. Report of the Metropolitan Asylums Board. Quarterly Report on the Progress of Segregation Camps and Medical Treatment of Sleeping Sickness in Uganda. Royal Borough of Kensington. New Zealand Public Health Department. Proceedings of the Royal Society of Medicine. Dr. E. P. Manley's Report to the L.G.B. on Awre Urban District. Dr. H. Timbrell Bulstrode's Report to the L.G.B. on Long Sutton Urban District. Dr. S. Monckton Copeman's Report to the L.G.B. on an outbreak of enteric fever in the Borough of Workington. Summary of the Annual Reports of the Medical Officers of Health in the administrative County of Gloucester. Bulletin of the State Board of Health of Maine. Washington Experiment Station Record. City of Aberdeen, 1907. Bulletin of the State Board of Health of Massachusetts. Metropolitan Water Board *Second Report* on Research work by Dr. A. C. Houston. Dr. Theodore Thomson's and Mr. P. M. Crosthwaite's Report to the L.G.B. on Cambridge University and Town Waterworks Company. Dr. H. Timbrell Bulstrode's Report to the L.G.B. on Holbech Urban District. Bulletin of the Sleeping Sickness Bureau. Dr. J. Spencer Low's Report to the L.G.B. on Winterton U.D. Dr. Reginald Farrar's Report to the L.G.B. on Whitby R.D. Dr. H. Timbrell Bulstrode's Report to the L.G.B. on East Elloe R.D.

The Essentials of Sanitary Science,

by Gilbert E. Brooke, M.A. Cantab., L.R.C.P. Edin., D.P.H., F.R.G.S. Henry Kimpton, 6/- nett.

Infected Ears: Intrameatal Treatment,

by F. Faulder White, F.R.C.S. The Celtic Press, 5/- nett.

Pamphlets.

An address on the General Pathology and Serum Treatment of Plague, by Khan Bahadur N. H. Choksy, M.D. The Essentials of Disinfection and Sterilisation by Steam at High and Low Pressures, by S. Delépine, M.Sc. M.B.

Memorandum as to Annual Reports of Medical Officers of Health.

APPOINTMENTS.

JOHN E. SANDILANDS, M.A., M.D., D.P.H., has been appointed Medical Officer of Health to the Royal Borough of Kensington.

ALEXANDER ROBB, M.B., C.M., D.P.H. Aberd., has been appointed Medical Officer of Health for Midlothian, Linlithgow, and Peebles.

FRANK ROBINSON, M.D., D.P.H., has been appointed Medical Officer of Health for the County of Cambridge.

J. S. SEWELL, M.D. Edin., has been appointed Medical Officer of Health to Horwich Urban District.

WILLIAM ARCHIBALD, M.B., M.D., D.P.H., Ch.B., has been appointed Medical Officer of Health for Luton.

F. A. SHARPE, M.B., B.S. Lond., D.P.H. Leeds, has been appointed Assistant Medical Officer of Health to the Derby County Borough.

E. H. T. NASH, L.R.C.P., has been appointed Assistant Medical Officer in the Elementary Schools, Derby.

M. GERTRUDE EDIS, M.D., has been appointed Medical Inspector of Schools by the Blackpool Education Authority.

WALTER TRAVERS CLARKE, M.R.C.S., L.R.C.P. Lond., has been appointed School Medical Officer for Morley, Yorks.

A. H. LOWE, M.B., C.M., has been appointed School Medical Officer to the Education Committee of the Kesteven County Council.

ADA MILES WHITLOCK, M.B., B.S. Lond., has been appointed a Medical Inspector of Schools by the Gloucestershire Education Committee.

FRANCES M. HARPER, M.B., Ch.B. Edin., D.P.H. Camb., has been appointed School Medical Inspector to the Lancashire Education Committee.

LAW REPORTS.

HOUSE OF LORDS.

November 26th, 1908.

BEFORE THE LORD CHANCELLOR, LORDS MACNAGHTEN, ROBERTSON AND COLLINS.

BUTTERWORTH AND ROBERTS v. WEST RIDING OF YORKSHIRE RIVERS BOARD.

Rivers Pollution Prevention Act, 1876, Sections 4, 7, 10.—Polluting Liquids from Factory.—Prescriptive Right to Drain with Sewer.—Duty of Manufacturer.

In answer to proceedings under the Rivers Pollution Prevention Act, 1876, Section 10, it was alleged that the liquids were not sent directly into the stream, but into a sewer which was the property of the sanitary authority, and that it was the duty of the authority to render them harmless, and further that the manufacturer had a prescriptive right to send such liquids into the sewer. It was held that such allegations afforded no defence, and that the prescriptive right was only protected when the manufacturer used the best means to make the refuse harmless.

This was an appeal from an order of the Court of Appeal, affirming an order of the King's Bench Division which in turn affirmed an order of the Yorkshire County Court.

Proceedings were taken by the respondent Board under Section 10 of the Rivers Pollution Prevention Act, 1876, for a summary order restraining them from committing an offence under Section 4 of that Act, by causing to fall or flow or

knowingly permitting to fall or flow, or to be carried into a stream in the West Riding, called the Stubbin Clough, polluting liquids proceeding from the factory of the appellants—the said Yew Tree Mills—and from the manufacturing processes therein carried on.

C. A. Cripps, K.C., and Lowenthal appeared for the appellants; Danckwerts, K.C., and W. J. Jeeves for the respondents.

The appeal was dismissed.

The LORD CHANCELLOR, in the course of his judgment, said the appellants have for a long time drained their manufacturing refuse into a pipe communicating with a stream. In that way, it falls into the stream. The pipe became a sewer within the meaning of the Public Health Act, 1875. It is not disputed that the manufacturing refuse is a "polluting liquid." In these circumstances the respondents, the West Riding Rivers Board summoned the appellants for breach of the fourth section of the Rivers Pollution Act, 1876. The defence is that the appellants had a prescriptive right to discharge it into the sewer (which I will assume to be true), and that it was then the duty of the local sanitary authority to dispose of it so as not to break the law. They maintain that they did not cause this refuse to flow into the stream within the meaning of the section, because, although it did flow into the stream by gravitation, all they (the appellants) did was to cause it to flow into the sewer which is under the control of the local sanitary authority, and that they had no responsibility for its ulterior destination. The Chancellor then discussed the various sections, and came to the conclusion that they were wide enough to cover cases such as the above, and then proceeded: When I turn to the fourth section of the Act of 1876, under which the present case arises, and also the seventh section, I find provisions which seem ample enough to prevent any unreasonable treatment of manufacturers. Every sanitary authority is obliged to give facilities for enabling manufacturers to convey their liquid manufacturing refuse into the sewers, provided it be not deleterious in the sense described, "or otherwise be injurious in a sanitary point of view." But even if such refuse be "poisonous, noxious, or polluting," the manufacturer is not guilty of an offence when he causes it to flow into a stream through a channel constructed, or in course of construction, in 1876, when the Act was passed, and is using the best practicable and reasonably available means to render it harmless. All user existing in 1876, is thus protected on the simple condition that the manufacturer uses the best means to prevent a nuisance. In the present case, the appellants or their predecessors had (I will assume) in 1876, and long before that, a right to discharge their refuse into the conduit they still use, and thence into the stream. But they have not used the best means of making their refuse harmless. Accordingly, they have not the benefit of this proviso. I see no hardship in that. In short, the natural construction of the fourth section seems to me to cover a case where refuse is discharged into a sewer, and thence into a stream. And other clauses of the Act indicate that this is

its meaning. And I see no injustice or inconvenience such as might lead me to suppose a narrower construction was intended.

Lords Macnaghten, Robertson and Collins, concurred.

SUPREME COURT OF JUDICATURE. COURT OF APPEAL.

November 23rd, 1908.

BEFORE COZENS HARDY, M.R., FLETCHER
MOULTON AND FARWELL, J.J.

OWEN v. FAVERSHAM CORPORATION.

Sewage Pollution.—Oyster Beds.—Injunction.

The Court of Appeal confirmed an injunction to restrain a corporation from discharging crude sewage into an arm of the sea in such a way as to pollute oyster beds.

This was an appeal from a decision of EVE, J., granting an injunction to restrain the Faversham Corporation from discharging crude sewage into an arm of the sea so as to pollute the plaintiff's oyster beds, but the operation of the order was suspended, so as to enable the corporation to remedy the matters complained of. The case is reported ante p. 253.

M. Lush, K.C., Jessel, K.C., and Gatey appeared for the appellants; and Macmorran, K.C., P. O. Lawrence, K.C., and Norman Craig for the plaintiffs.

The case was not argued at length as it was generally agreed that the law was governed by Foster v. Warblington District Council (1906), L.K.B. 648, and it was evidently the intention of the parties to take the case to the House of Lords.

The Court dismissed the appeal as they were of opinion that the case was governed by the above decision, but it was agreed that the operation of the injunction should be further suspended if the appeal to the House of Lords was lodged within one month.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

October 20th, 1908.

BEFORE LORD ALVERSTONE, L.C.J., BIGHAM AND
WALTON, J.J.

BUNDY v. LEWIS.

Sale of Food and Drugs Act, 1875, Sections 6, 8. Paregoric.—Paregoric Substitute.—Sale to Prejudice of Purchaser.

If a purchaser asks for a specific article and is supplied with another as a substitute, and that other is labelled as being a substitute, the justices may properly find that there was no sale to the prejudice of the purchaser.

This was a case stated by Justices of the West Riding of Yorkshire, on the hearing of an information laid by J. H. Bundy, an inspector of the County Council of West Riding, against one Lewis, a chemist, under Section 6 of the Sale of Food and Drugs Act, 1875. The information alleged that Lewis, by his assistant Neville, did unlawfully sell to the prejudice of Bundy, a certain drug, to wit, paregoric which was not of the nature, substance and quality demanded.

Upon the hearing of the said information, the following facts were admitted or proved in evidence:

The appellant, Bundy, was an inspector of weights and measures charged with the execution of the Sale of Food and Drugs Acts, 1875 to 1907, and the respondent, Lewis, was a chemist carrying on business, amongst other places, at Jump, in the parish of Wombwell, in the said Riding.

On the 18th day of March, 1908, the appellant entered the respondent's shop at Jump, and asked Leonard Neville, the servant of the respondent, to supply him with four ounces of paregoric, and handed him a bottle in which to put the same. The said Leonard Neville thereupon filled and corked the bottle and afterwards affixed a label upon the bottle. Whilst affixing the label, the appellant asked the said Leonard Neville what he was going to do, and he replied, "I am putting the label on," and appellant replied, "That's all right." The said Leonard Neville (in accordance with the custom of the trade) then wrapped the bottle in an opaque wrapper and handed the same to the appellant who subsequently unwrapped it.

The label upon the bottle contained the following printed words, namely, "Paregoric—Poison," but the word "Poison" had been struck out in pencil and the word "Substitute" added in pencil. The label also contained the name and address of the respondent.

The material part of the analyst's certificate was as follows:—

"I am of opinion that 100 parts by weight of this sample contained in parts by weight:

Absolute alcohol	-	21.85	parts by weight
Benzoic acid	-	.385	" "
Sugars	-	9.750	" "
Water, camphor and oil of aniseed	-	68.015	" "
		100.000	

"In my opinion this sample contains only half the amount of alcohol which should be present in a genuine sample of paregoric, and it is entirely deficient in tincture of opium which is an essential constituent in a paregoric made according to the formula given in the British Pharmacopoeia."

It was proved that paregoric was not sold because the said Leonard Neville, being an unqualified assistant, could not sell poisons without committing an offence against the Pharmacy Acts.

The justices determined as follows:—

(a) That the appellant had asked to be supplied with paregoric and had received an article which was not paregoric, but that the sale was a sale of paregoric substitute, and that the respondent had not acted fraudulently, and that the sale was not to the prejudice of the purchaser.

(b) That even if the sale were of paregoric, the respondent was entitled to the protection afforded by Sec. 8 of the Sale of Food and Drugs Act, 1875, by reason of the label affixed upon the bottle in which the article was supplied, which disclosed the fact that the article sold was not paregoric but paregoric substitute.

Daddy appeared for the appellant, and Disturnal for the respondent.

The appeal was dismissed.

LORD ALVERSTONE, L.C.J., said that *prima facie* an offence was committed, as the inspector asked for paregoric and did not receive it. Section 8 had nothing to do with the case. The only ground upon which the decision of the justices could be supported, was that the sale was not to the prejudice of the purchaser. In the special circumstances of the case, he thought that the sale was not to the prejudice of the purchaser.

Bigham and Walton J.J., concurred.

December 1st, 1908.

BEFORE BIGHAM AND WALTON, J.J.

HAGUE v. DONCASTER RURAL DISTRICT COUNCIL.

Pollution of Stream.—Death of Cattle.—Continuing injury.—Public Authorities Protection Act, 1893.

The regular pollution of a stream is a continuance of injury or damage within the meaning of the Public Authorities Protection Act, 1893, and the owner of cattle which have died from such pollution, can recover damages for the loss so occasioned, although the action has not been commenced within six months from the date of the death of such cattle, provided the pollution continues to within such time.

This was an appeal from a judgment on the Barnsley County Court, by which the plaintiff was awarded damages for the loss of three cows. The action was brought for an injunction to restrain the defendant council from sending an effluent from their sewage works into a stream of such a nature as caused pollution and for damages. An injunction was granted and damages assessed at £60. The appeal related only to part of the damages, namely, for those awarded in respect of three cows which had died respectively in November, 1906, July, 1907, and September, 1907. The action was not commenced until April, 1908, and it was contended that inasmuch as these cows died at dates more than six months previous to the commencement of the action, the claim was barred by the Public Authorities Protection Act, 1893. The pollution of the stream continued up to the time the action was begun.

The Public Authorities Protection Act, Section 1, provides that "where after the commencement of this Act any action, prosecution, or other proceeding is commenced in the United Kingdom against any person for any act done, in pursuance, or execution, or intended execution of any Act of Parliament, or of any public duty or authority . . . the following provisions shall have effect:—(a) The action, prosecution, or proceeding shall not lie or be instituted unless it is commenced within six months next after the act, neglect, or default complained of, or in the case of a continuance of injury or damage, within six months next after the ceasing thereof." The county court judge held that the injury was continuing, and that the Act afforded no protection.

E. Shortt appeared for the defendants, E. Final Atkinson, K.C., and T. R. D. Wright for the plaintiff.

The appeal was dismissed.

BIGHAM, J., in the course of his judgment, said he had come to the conclusion that the county court judge was right. The Act which the defendants did in execution, or pretended execution, of an Act of Parliament, was to pollute the stream and not to kill the cattle. The pollution began before the cattle died and continued up to the commencement of the action. The injury was continuous within the meaning of the Public Authorities Act, and the damage happened from time to time whilst the Act was being done.

Walton, J., concurred.

RECENT PUBLIC HEALTH LITERATURE.

Bacteria.

DUDGEON (L. S.) The Horace Dobell Lecture on the latent persistence of pathogenic bacteria in the body. *Lancet*, 1908, ii, 1651, also *Med. Press*, 1908, ii, 548.

Children.

VAN DERSLICE (J. W.) The school child. *New York Med. Jour.*, 1908, lxxviii, 881.

Cholera.

GAMALEIA (N. T.) Die Cholera in Odessa in September, 1908. *Berl. Klin. Wochens.*, 1908, xlv, 2105.

Diarrhoea.

BREITENBACH (O. C.) Choleriform diarrhoea of cold weather—"Winter Cholera." *Jour. Amer. Med. Assoc.*, 1908, li, 1499.

Enteritis, Epidemic.

HANDSON (L.) and WILLIAMS (H.) Account of an epidemic of enteritis caused by the "Liverpool Virus" rat poison. With bacteriological report by E. Klein. *Brit. Med. Jour.*, 1908, ii, 1547.

Food.

CHAPMAN (A. C.) Food extracts made from yeast. *Brit. Med. Jour.*, 1908, ii, 1741.—UHLENHUTH (P.) and HUBENER (E.) Ueber die Verbreitung der Bakterien der Paratyphus B.—und Gaertner-Gruppe und ihre Beziehungen zur gastro intestinalen Form der Fleischvergiftungen. *Medizinische Klinik*, 1908, iv, 1823.

Food Inspection.

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THE DEPARTMENTAL COMMITTEE ON THE MIDWIVES ACT.

IN our last issue we had occasion to comment somewhat adversely on the constitution of the Departmental Committee on the Midwives Act, which, as originally constituted, contained no representative of the public health service. We are now glad to note that the committee has been strengthened by the addition of Dr. Francis E. Fremantle, Medical Officer of Health for the County of Hertford. Dr. Fremantle, who is president of the Home Counties' Branch of the Society of Medical Officers of Health, has paid special attention to the administration of the Midwives Act, and the proximity of his district to London will enable him to devote the necessary time to the work of the committee. His appointment will undoubtedly give general satisfaction to his colleagues.

The questions that the committee have been appointed to consider are not only important in themselves, but they involve principles that are of vital importance to the medical profession and to the public. Two, at least, call for special mention. The first relates to section 1 (2) of the Act, which provides that from April 1st, 1910, no uncertified woman shall habitually and for gain attend women in childbirth otherwise than under the direction of a qualified medical practitioner. Fears have been expressed that in certain districts this provision will bring about a serious shortage of midwives, and it has been proposed to avoid this difficulty by postponing, under various expedients, the operation of this very important part of the Act. We hope that no medical officer of health who gives evidence before the committee will support a proposal of this kind. The deliberate postponement of an

important public health measure would be a retrograde step, thoroughly bad in principle, which would injuriously affect other branches of public health administration, and would, we believe, be without precedent in this country. The operation of section 1 (2) of the Act will no doubt give rise to difficulties; but the same could be said of most public health measures, and hitherto it has been the practice of the public health service to meet difficulties, not to avoid them. In this connection we would draw attention to the question raised in our present issue by Dr. Handford, who expresses himself as "anxious for the honour of the medical profession that they should not, by taking too narrow a view of their own interest, help to prolong a condition of unqualified and incompetent practice on the part of these women who have been already shown to be such a danger to the community."

The second point we would mention is the remuneration of practitioners called in under Rule E. 18. The Midwives Act resembles too many other measures in that it provides the machinery for imposing obligations on the medical profession without making any provision for payment for the work done in fulfilment of those obligations. A practitioner called in under Rule E, 18, is to all intents and purposes summoned by the State to apply his professional knowledge for the benefit of the State, and it is clearly the duty of the State to guarantee adequate remuneration. The justice of this principle is now generally recognised, and in some districts it has been carried into effect. In Liverpool and Manchester for instance, the local supervising authority pay the fees of doctors called in to attend patients who are unable to pay, and the results appear to be eminently satisfactory. The matter, however, can only be adequately dealt with by amending legislation, which, we hope, will not long be delayed.

MEDICAL INSPECTION OF SCHOOL CHILDREN.*

By GEORGE NEWMAN, M.D., D.P.H., F.R.S.E.,
Chief Medical Officer of the Board of Education.

MY function to-day is that of a listener; I am not here to deliver anything like a formal address. But I should like to say that it is particularly pleasant to me to be here for two reasons. In the first place I am pleased to be here to preside when Dr. Kerr is to deliver a lecture. For we are all in agreement upon one point—how greatly indebted we all are as members of this school medical service to the admirable work which has been done for school hygiene in England by Dr. Kerr; and in the second place, I am glad to be here to wish you, on behalf of the Board of Education, a very successful course. I hope for it that good fortune and success, which is attained not only by attendance in large numbers, but by the fruit of the course which will be found, I hope, in days to come. I look upon all courses of this nature as extremely valuable at the present time. They seem to me to be valuable mainly for two reasons. In the first place, a course of this kind is valuable because it makes for efficiency of medical inspection. I admit that the word "efficiency" is open to misunderstanding; still we all know what we mean by it. A second valuable result is that it secures a greater degree of uniformity in medical inspection throughout the country. Those are two reasons which very fully justify the holding of a series of lectures of this kind, for which we are mainly indebted to Dr. Kerr and his colleagues—efficiency and uniformity of medical inspection. It is from that efficiency and from that uniformity that good results are likely to come.

Perhaps you will let me say a very few words under each of these headings. First, with regard to efficiency. The first point in efficiency is the securing of a good result as regards the child. That does not mean that medical inspection is to be an elaborate clinical examination of every child in all public elementary schools, nor does it mean that any children in these schools are to be shirked or neglected. What we have to try to do as members of this school service is to strike a happy medium, the only criterion of our work

being the improvement of the condition of the child. So that medical inspection does not mean on the one hand the thorough clinical examination of each child, or on the other hand, the passing of forty or fifty children before the doctor, for him to endeavour to spot those who require examination. It means that we must strike the happy and middle course. A further point with regard to efficiency is the extreme importance of a close co-operation between the various branches of the school medical service; in the first place, between the Board of Education and the local education authorities; in the second place, between the local education authorities and their officers; and, in the third place, between the school medical officers and the teachers. I commend this to your consideration, that you will only get efficiency of medical inspection in England in so far as you have a broad and simple and sensible co-operation on those three lines. I am not sure which of the three is the most important. I am quite sure that the one of most immediate and personal importance to us in our work is the last—a happy and intimate co-operation between the school doctor and the teachers. The teachers in these schools are a large body of valuable public servants, who deserve well of our consideration, and we want, as far as we can, to co-operate with them as allies, as colleagues, and as partners, rather than attempt to impose upon them or their schools, some particular medical ideas or ideals of our own. To secure this happy co-operation on these three different levels, we need a great deal of tact, sympathy, good sense, and a broad view. You remember the admirable definition of State Medicine given by Sir John Simon, the father of modern preventive medicine: "It is the province where Medicine joins hands with Common Sense."

Then a word or two about uniformity. While it is extremely important and, indeed, necessary, that at initiation this work should be kept reasonably fluid and elastic, there are some points upon which it is desirable there should be some uniformity. I will mention four of them. There is first, medical inspection at certain periods of school life; secondly, the adoption of a similar schedule of medical inspection; thirdly, the following of a more or less similar standard of reporting; and fourthly, uniformity in some departments of administration. It is necessary for the good

of this movement, as a national movement, that there should be at least a considerable degree of uniformity in each of these four respects. It is extremely valuable from the point of view of the Board of Education—that there should be free communication between the members of the school medical service throughout the country and the Medical Department of the Board in London. We are desirous of being kept as closely in touch as possible with all currents of opinion and experience.

Finally, there are three broad principles which you and I need to remember in the statutory initiation of this extremely difficult and delicate, but highly important, national movement of school hygiene. First, our work must of necessity, for some years to come, grow in a very gradual, and perhaps you will think slow, way. From step to step we must let it grow rather than attempt to impose upon it our own cast-iron views, whatever they may be, as to what the future will bring. Let us remember the gradual growth of the public health service in this country since 1847. We have seen in fifty years how widely and deeply the public health influence has been felt in the State. But it has only come gradually. We are now at the beginning of another great national movement, and we must not be disturbed or discontented if we do not possess exactly all those rights and powers that we think we should like, even at the very beginning. We are bound to go step by step. Much depends upon law. No doubt certain Acts of Parliament which we could think of would be all the better if they were amended in certain directions. But it is not our business at the moment to work under an amended Act or under an ideal system. It is our business to work with what we have. Much depends also upon an educated public opinion, and much depends upon each stage in the evolution of preventive medicine. The first broad principle, then, is one of gradual and slow growth. The second principle is that medical inspection is only part of the whole work of school hygiene, and school hygiene, in its turn, is but part of the whole work of the health of the State. Medical inspection is not the be-all and end-all. It is the earnest and necessary beginning of school hygiene, of what it is, and of what it may become. When medicine comes into relation with the State we must remember that medical science is, after all, only a joint-

worker with other national powers and interests. We are only joint-workers under the law with school teachers, managers, members of local authorities, and all sorts of servants and officials in the Local Authority and in the State. Therefore, we must be prepared to do a great deal of giving and taking, remembering that due place must be given to contending claims and issues and to various circumstances besides medical questions. The third principle is that we must aim, not at the best but *at the best that is practicable*. We cannot secure the best in medical inspection or school hygiene at the present moment. We must aim to get, and work to get, what is practicably the best under all the circumstances. I am anxious that we should so do our work as to commend it to the opinion and judgment of the English people. If we act wisely and sympathetically, I think we shall do so in the long run. So I hope that this course may assist both in efficiency and uniformity of medical inspection, and that it will at least have the advantage of bringing us together in useful co-operation and good understanding.

MUNICIPAL EXTRAVAGANCE IN CAPE COLONY.—The extent to which many municipalities have burdened themselves by unrestricted borrowing requires no exemplification by me, as such cases are common knowledge. But the instances in which large sums of borrowed money have been expended on unnecessary objects, or on schemes of an unsound character, do not so frequently become public. One of the objects on which such unnecessary expenditure is frequently incurred is that of the provision of a pretentious and unneeded town hall, and as an example of this I cannot do better than describe the present position of a municipality which, with a total municipal valuation of under £250,000, and with only about 200 dwellings, and a population, at the last census, of only 2,342, of which less than half were Europeans, has recently erected a town hall which has cost it approximately £13,500; yet this municipality is urgently in need of a proper scheme for the supply of pure drinking water, and the details of such a scheme, estimated to cost about £20,000, have been worked out and special legislative sanction obtained for it, but the undertaking is stopped owing to want of funds. In or about 1907 a grant of commonage land, chiefly agricultural lots, was made to the town by the Government, and the sale of these produced some £14,500, but instead of reserving this money for a water scheme, all but £1,000 of it was spent, as above mentioned, on the erection of a great town hall, twenty-five if not fifty years in advance of the requirements of the community, and which, I am informed, will cost a considerable sum annually for its upkeep.—*Annual Report of Dr. A. John Gregory, Medical Officer of Health of Cape Colony.*

* Report of an introductory Address to a course of lectures by Dr. Kerr and others, on the Medical Inspection of School Children, delivered at the Rooms of the Society of Medical Officers of Health on January 11th, 1909.

THE MEDICAL OFFICER OF SCHOOLS, HIS WORK AND HIS REPORT*

By JAMES KERR, M.A., M.D. D.P.H.,
Medical Officer (Education) to the London County Council.

It is proposed, in the course of the next few days, to indicate to you the outlines of work which you may be called upon to do as medical officers of schools.

As students of medicine you were interested in the application of medical knowledge to the individual, then later, as public health students, you had to consider mankind in the mass. With school work both views have to be taken. You consider the constantly changing developing children, both individually and in the mass. School hygiene is probably regarded in England at the present time as being more intimately part of the general public health service than it has ever been hitherto. There are several points of contact as in the matter of infectious and contagious diseases, and also out of school and home conditions, but the more you get to know about it, the more will you appreciate that the trend of the future must be specialization and differentiation combined with such administrative co-ordination as is necessary.

The most valuable asset of the medical officer in the schools will be restraint of judgment; to recognise and insist upon those things alone which are requisite and necessary; to be always rather inclined to make the best of circumstances, and whilst going fearlessly forward, to remember the value of compromises, of obtaining results by subconscious instruction rather than apparently extreme demands, and to await occasions and opportunities for further developments. If the proper seed is sown the crop will come.

As a public official, the school doctor has two sides to his work. He has to work economically and efficiently with business men, who are only inclined to regard definite results. In the case of the children, he has to differentiate them as to health and fitness for education. Comparatively slight experience and not very much time is needed to classify children as being normal, or crippled, deaf or blind, or otherwise unfit for school. Fine diagnoses are not called for, but it may require considerable experience and time to obtain other than these merely practical results.

* Introductory Lecture of a course of lectures on the Medical Inspection of School Children, delivered at the Rooms of the Society of Medical Officers of Health, on January 11th, 1909.

For instance, to say that a child should be compelled to attend a school for the blind, or that parents should have pressure put upon them to obtain surgical treatment for a child, or to differentiate between aphasia, deafness or imbecility in a particular case, may mean a very considerable experience of special medical practice.

Personally, I had fifteen years' experience for hours daily in hospital wards and out-patient rooms, before beginning this school work in London, but, fortunately for the majority of cases, our practical aims are simple compared with any scientific enquiries or desires. In any case, then, all the circumstances are taken into account and a compromise generally adopted which gives the best scientific or medical result for the amount in trouble or money which is to be expended. You, for instance, would not dream of asking for a daily disinfection of school premises, nor in respect to sanitary fittings would you require the same extreme precautions in school offices as in a private dwelling house. Manhole covers, which in the drainage arrangements of a house would be desirable, might involve dangers from the school point of view, far beyond any sanitary advantages.

The educational aspect of all school work, medical or otherwise, must never be forgotten. There is a possibility of medical inspection even rising to have an educational value in the school.

A well marked tendency can be noted in recent legislation to put all matters connected with the evolution and development of the individual under one heading and one case.

Whenever the State concerns itself in any way with the developing child as a child, from the day the mother's care is changed for the baby room, till the full age for school exemption is attained; whenever the State interferes to aid or control during the plastic period of development, this action is regarded as educational. It is the only wide and philosophic view of education that can be taken. Whether it be teaching the ordinary conventions of civilized life, reading, writing, and so on, or cleansing or feeding at the public expense, removal from evil surroundings, or protection from cruelty or overwork, care in nursery schools, or medical inspection or treatment, in each case where there is any public duty or power conferred by law that has been given to the education authorities.

Further carried out, this very important and

unifying principle will simplify legislation and bring all educational branches into due relation and proportion, and avoid future conflicts and tangles of overlapping authorities.

With a sufficient educational representation on the Royal Commission on the Feeble-minded, they would have avoided the mistake of suggesting two separate authorities to do medical enquiries in the elementary schools. One, the medical staff of the education authority, doing the medical inspection of the ordinary children, and acting in intimate relation with the public health, and the other a staff under the authority of the proposed Board of Control, necessarily a separate staff, as they have all to do with lunacy and asylum work, sent to look for and superintend the children they consider feeble-minded. However, there is little likelihood of such proposals ever being formulated for legislation.

The officers who do medical inspection are officers under the education authority. Many considerations at once suggest that there should be reasonable security of tenure for the medical officer of schools, say after the expiry of twelve months' probation.

The Board of Education have for the purposes of their own code decided to "recognise" school medical officers, and can, therefore, I presume, if they think that circumstances justify such action, refuse to recognise a particular officer nominated by the Local Education Authority. Whether this power could ever be of effective service in protecting officers against dismissal without cause or because of too efficient public service is another question.

A few months ago in Lancashire, an able and experienced school medical officer, who during nine years had built up as thorough a system of school superintendence as was possible, was replaced quite against his wish by a medical officer of health, who had yet to win his spurs in this work, and the sequel was seen a few weeks after the transfer, in an advertisement for a cheap assistant for the medical officer of health. This week it is a Yorkshire university town which affords the current example of how not to do it in provision for an efficient medical inspection.

The whole work of school hygiene has yet to be undertaken. Medical inspection which is a part, perhaps might even be called the foundation, has almost been taken for the whole, in being made a statutory duty. Treatment, which is a permissive power of the

authorities, is almost the corollary of inspection, and the purely educational hygiene which is of immense importance, is as yet practically almost non-existent.

The greatest importance is to be attached to having a definite aim in all your school enquiries. Without a definite object in view, a school visit is almost wasted, and you are apt to waste other people's time too.

The importance of regarding teachers as colleagues is great. In school the head teacher should always be regarded as the captain on his own quarter-deck. Teachers are necessary helpers, and in some ways their knowledge of the children is as important to interpret the medical inspector's results as his own training.

As a hospital surgeon I have heard terrible accounts from patients of my own doings as school doctor, and *vice versa*. With this experience you may be advised never to believe any adverse statement about an outside or absent practitioner, but at the same time believe your own eyes, and deal practically with the facts actually before you. Your own evidence is more worth to you than the opinions of anyone else.

Sometimes, too, it will save future trouble if you make a rule of never saying more than is absolutely necessary about any individual case. But anything in the nature of a decision should always be noted at the time, with the exact facts on which it is based. Even if decisions have not to be supported later in the witness-box, they may have to be reviewed or accounted for, and definiteness in every case is a necessity. It is where women mostly fail.

Now as to reports. To deal with these at the beginning of our course may seem rather like putting the cart before the horse, but it happens to be convenient.

The school doctor should arrange, if possible, to report personally to the sub-committee under whose order of reference he works, whether general purposes, elementary schools, or whatever the name may be.

He should arrange that a report by the medical officer of schools stands as a routine matter on the agenda papers at regular intervals, say quarterly, and read it personally to the committee. He is the medical adviser, and, having given advice, his responsibility in any affair ceases.

There may be other special reports asked

for where it might be advisable or advantageous to the committee to have his personal attendance and assistance.

In the writing of reports, brevity and simplicity are of the first importance. Sir Clifford Allbutt in his "Notes on the Composition of Scientific Papers," a little book published by Macmillan's, advises never to put in a word that can be left out, and it is good advice.

It will be a help in reporting on any topic if the writer states clearly for himself—

- (i.) The exact subject to be dealt with.
- (ii.) The method of enquiry.
- (iii.) The facts obtained.
- (iv.) The conclusions arrived at.

Too formal a style of reporting, or too classified a manner of setting out things, especially if numerous obvious facts are included in the classification, always detracts from the impression produced. Reports for committees should be clear, and if the expression may be allowed diagrammatic. The particular point required should stand out above all others.

The Annual Report, required by the Board of Education, is to be made by the medical officer of schools to the education committee, and two copies are to be forwarded with any observations the committee may wish, to the Board of Education. It is to be hoped that the observations may never be a cause of friction between the committee and their officer.

The report has also to be made up to coincide with the calendar year. For school work numerous objections to this occur, as the school years are mostly bounded by the summer vacations. It also throws the writing of the report on the medical officer of schools at his busiest time, but the importance of uniformity is so great that the date of our last London Report has been altered to end with the year ending with December 31st.

Circular 596 of the Board of Education gives an analysis of topics which it is suggested the annual report should include. That circular was somewhat limited in its scope as it only applied to the Administrative Provisions Act for 1907, so that the report is only dealt with comprehensively from the medical inspection point of view. Educational hygiene proper, the effects of lessons, fatigue

and so forth are not directly included in the topics of the circular, but should be included in your work.

The hints and outlines suggested in this Circular 596 are well worth study by all. Common sense is all that is required for the interpretation. There is no desire that you should do everything—in fact the circular states much "will not immediately be attainable."

Section (a) suggests a general report on matters of school hygiene. Very little need be said except as to matters which require amelioration, but a good scientific method for the medical officer to follow would be in successive years to take up one topic, such as ventilation, lighting, furniture and so on, and for that year prepare to deal exhaustively and completely with that one subject, merely glancing at the others.

The next *section (b)* on the correlation of school and public health services will be dealt with practically under the later sections on treatment and on infectious diseases.

The third *section (c)* asks for certain returns which are an administrative check on the work done. The value of such returns is only relative, because such matters as the number of visits paid to schools or departments, the average time per head taken in examination, may bear no relation either to the amount or value of the work done.

In *section (d)* a review of the facts disclosed by medical inspection is asked for, under the headings of Circular 582, including tables showing the height and weight of children inspected according to sex and age at the date of inspection. On this matter of tables, one must call the medical inspector's attention to the uselessness for any purposes of comparison of any tables not prepared in accordance with certain rules. The majority of figures about medical work in schools published in this country, and often abroad, too, are of comparatively little use from this defect. Even the extensive range of observations on school children carried out by a British Association Committee through a series of years, lost in value for want of analysis according to age.

The basis of selection must always be stated in any group of children you deal with. Social selection is most important; the children of a slum school are physically inferior for their age to those in suburban schools. The class (socially) should always

be somehow expressed. The sexes should always be stated separately; that is done in London from the start by having the records for boys all tinted blue, and those for girls white.

In analysing any qualities the next point to attend to is age. The age should be recorded in years and months; as a check, the date of birth should also be given on the record cards; it is sometimes useful; and if at any time separate crops of children, that is, those born in the same years, are required for investigation, this would be necessary. For age groupings the age last birthday should be used. Sex and age are the first analyses. Sometimes it is useful to further analyse by school standard. This is a rather indefinite basis, but still defines the child's intellectual capacity better than any estimate of the teacher will usually do. As the average height in standard increases for children at any age, so does their physical measurements also increase.

Whatever subject is being set out, the total number of children, normal and abnormal, should always be given. Even if percentages alone are stated, it is always more satisfactory to know whether the percentage is on a dozen or ten thousand cases.

The *Section (e)* asking for a general review of home circumstances, and social and industrial conditions to the health and physical condition of the children inspected, expresses what is likely to be beyond your ken in any exact way for a long time. Our London enquiries have been long, difficult and without very definite result in such matters as nutrition even. These enquiries are likely to be beyond most men, simply because they cannot afford time, and, indeed, the Board suggest a consideration of these facts in so far as they have come under notice.

Section (f).—Review of the methods employed or available for the treatment of defects is to be dealt with in a special lecture.

Section (g).—The review of action taken to detect and prevent the spread of infectious diseases. The recognition of the personal spread of these diseases has altered our ideas as to school closure and school dissemination. The most important observation which every medical officer will make will be his helplessness, whilst a premium remains on getting children into school, whether in risk of disease or not. The old epidemic grant, whereby absences for infectious disease were allowed to count

as if attendance for grant purposes, would amply repay the expenditure if the rule were re-established, as no doubt it will be in some form or other ere long.

Section (h).—A review of the adequacy of methods for special education. The Blind and Deaf Act of 1893 is compulsory, but the Act of 1899 (Defective and Epileptic) is adoptive and does not cover much of the country yet. It may be your duty to recommend the Authority to put this into force.

Section (i) concerns instruction in personal hygiene and temperance, physical and breathing exercises, and open-air schools, school camps and so on. These are all matters in which the Board of Education have practically entire control, and consequently the medical officer will be chary of giving advice until he has carefully considered all the educational points involved. He has now not only to be a hygienist, but an educationalist also.

On the whole the range of the annual report is well set out in this circular. Its preparation will be an education to the medical officer in the things he has omitted. It will keep the work up to a high level if conscientiously written. It will need a long amount of preparation, but in school hygiene it is as in all other branches of medicine, and, as Professor Osler has taught us, the master word in medicine is work. How much need is there, then, of public recognition of this, and adequate remuneration for the men and women who do the work.

The medical officer in the school has all the more need to work conscientiously, in that the work of the next half dozen years will have far-reaching effects, far greater possibly than anyone now suspects.

It will alter the training, ideals and status of the teacher for the better, and with this it will profoundly modify the official regulations and syllabuses which enmesh every minute of school life. It will also go far to introduce a high-grade public medical service. The coming of the school clinic means reform of the present wasteful and inadequate system of hospitals.

But beyond all these is the far-reaching social and political effects of a widespread ideal of healthy lives for all; this will have its reaction in the freeing to all people of the natural conditions of air, water and land now held as the possessions of a few.

May we all help towards that happy end.

THE CO-ORDINATION OF MEDICAL INSPECTION WITH PUBLIC HEALTH WORK *

By H. MEREDITH RICHARDS, M.D., B.S.,
Medical Officer of Health, Croydon.

I WOULD ask your attention this afternoon to two questions of interest to those engaged in the medical inspection of school children.

1. The co-ordination of their work with other public health work in the district.

2. The preparation of the annual report.

With regard to the necessity of co-ordinating all kinds of public health work, there is now no difference of opinion, and it is unnecessary to discuss the details of the general organization as they have already been settled for most of us by our local education authorities.

Whatever the local arrangements may be, it will probably only be possible, in a minority of instances, for the medical officer of health to make the whole or even a large proportion of the actual inspections contemplated by the Act of 1907. This being so, it is essential that those who are engaged in the schools should so arrange their work that they can obtain the maximum assistance from, and be of the greatest assistance to, other workers in the public health department.

First, let us consider the case of large urban districts or county boroughs (such as my own), where the local education authority and the local sanitary authority are practically identical.

It is hardly necessary, perhaps, to refer to the use which can be made of the clerical staff for tabulating returns, issuing notices, and so forth.

The health officer, too, will often offer facilities for the gradual development of a central school clinic.

The medical inspector should also be aware of what diseases are prevalent in the district, and some such weekly return as that produced should be available at the health office† as also should a report on the specimens examined each day in the local laboratory.

Health Visitors.—In many towns qualified women with hospital training have long been engaged in giving advice as to infant feeding,

supervising cases of phthisis, and in investigating the non-notifiable infectious diseases. It is a simple matter to combine the office of health visitor and school nurse. The officers so appointed would then have the following duties in respect to school children.

(1). In the school they would act as school nurses and assist at the inspections.

(2). They would investigate illness among absentees.

(3). They would act as a medium between the medical inspectors and the parents, and keep children under observation until the advice given has been followed.

(4). They would give detailed advice in the homes on dietetics, domestic hygiene, and so forth.

(5). They would assist at the school clinic.

Personally, I have found this combination of health visitor and school nurse extremely valuable. After a time, the health visitor gets to know the families in her district, and can often give invaluable information to the inspector, especially when the parents are not present at the medical examination in the schools.

It need hardly be said that the borough laboratory should always be at the disposal of the medical inspector, and that useful information can often be received from and given to the medical officer of the local fever hospital.

Co-ordination of Work in connection with Communicable Disease.—It is impracticable and unnecessary to discuss the whole modern plan of campaign against infectious disease in schools. It is clear, however, that the medical inspector, the school medical officer, and the medical officer, must each take an active interest in this matter. From the last code it is also clear that, should any difference of opinion arise as to the exclusion of particular children or the closure of schools, the final decision rests with the sanitary authority acting on the advice of the medical officer of health. It is, however, undesirable that there should be any difference of opinion, and none is likely to occur if due attention is paid to the following points:—

(1) The need for explicit standing orders as to health.

(2) A comprehension of the value of school closure.

(3) An understanding as to the value and limitations of disinfection.

Standing Orders in many districts require revision and modification, especially in reference to contacts. The orders should not only define the duty of teachers, attendance officers, and school nurses in specific instances, but should be annotated, so as to give reasons for the rules, and thereby secure the maximum amount of intelligent co-operation. Any new departures may with advantage be brought to the notice of head teachers at a conference called for that object.

There should also be a clear understanding among the medical officers as to the exact procedure to be adopted when suspicious cases are detected by the medical inspector. This applies especially to sore throat.

School Closure.—There should be agreement as to the circumstances which warrant school closure which, in my opinion, is rarely of service in checking the spread of disease in a well administered district, though it may occasionally be advisable for economic reasons. In the latter case, the local authority can close the school under Article 45*b* of the code. School closure may also become necessary if the premises are insanitary, or if the teachers and managers will not co-operate in more rational methods.

The routine resort to school closure, say for measles, when the percentage of attacks reaches 10 per cent., appears to be founded on a misconception of the natural history of the disease, and should be abandoned. By that time every susceptible child has been infected, and all one accomplishes is to give school managers an idea that something very drastic and effective has been done. Such a procedure always reminds me of a certain practitioner, who gained great kudos by applying pitch plasters to superficial bruises, and not allowing them to be removed for three weeks, with the satisfactory result that every patient was not only cured, but ever afterwards sang the praises of Dr. X's plasters.

Disinfection.—In reference to this I should like once more to reiterate Chapin's dictum that disease is spread by infected persons rather than by infected things. I do also sincerely hope that medical inspectors will not play into the hands of the wily manufacturer of germicides by suggesting the disinfection of premises, when the bacteriological exami-

nation of a class or the exclusion of individual children is really indicated. Nor, I trust, will they vaunt the success of their favourite germicide in stamping out an epidemic which has already attacked the whole of the susceptible population exposed to infection.

Cleansing of Persons Act.—Under this Act local authorities (both Sanitary and Poor Law) can grant permission for the use of their disinfecting apparatus for cleansing verminous persons. In certain instances these powers are useful when dealing with body lice and scabies. For this purpose local authorities should be urged to add baths to their disinfecting station or shelter, if not already provided.

Work in rural and small urban districts offers more difficulty. In the first place, the medical inspector will, in most cases, have no official connection with the local sanitary authority, and, in the second place, public health organization is usually even less perfect than it is in large towns. One must, therefore, frankly acknowledge that much that can be done in large towns is, for the moment, impracticable in rural districts. In any case, however, it would seem essential that the school inspectors, county medical officers, and local medical officers of health should confer and come to a definite understanding as to standing orders, conditions warranting school closure, the supervision of contacts, and so forth. It is also desirable that every use should be made of the local sanitary organization, not only for the supervision of contacts, but for all purposes necessitating a visit to the homes of the scholars.

PART II.

Notes on the Preparation of Annual Reports.—In Circular 576 of the Board of Education, it is laid down that the report of the school medical officer is to be for the calendar year, and that two printed copies are to be forwarded by the local authority to the Board of Education with any observations which they may think fit to make. The selection of the calendar year is, on the whole, satisfactory, though I have heard it suggested that difficulties may arise in convincing the central authority that the requisite amount of work has actually been done. This is due to the fact that the school code runs from August 1st to July 31st, and the amount of inspection that

* A Lecture delivered at the Rooms of the Society of Medical Officers of Health, January 13th., 1909.

† This is a form showing for each school in the borough the number of children reported each week to be suffering from communicable diseases.

is absolutely compulsory will vary with the requirements of the current code. I cannot imagine, however, that the programme of any local authority will approach so near the minimum as to cause difficulty in this respect.

As regards the subject matter of the annual report, much information is contained in Paragraphs 5 and 6 of Circular 596, and I now propose to briefly review the suggestion contained therein.

First we are told that a general statement of local circumstances would be a useful part of the report. This, I take to refer to a summary, such as generally prefaces the report of the medical officer of health, and would include such matters as population, acreage, rateable value, education and other rates, child population, children on register, number of schools with their nominal accommodation.

Next the Board recognize that their suggestions imply a degree of comprehensiveness not immediately attainable. It might also be suggested that the cubic capacity of the report must be limited if it is to be published in reasonable time, and is not to absorb an undue amount of available energy.

Here one may digress for a moment to consider the objects of annual reports. Firstly, a general survey of the work of the department is invaluable to the medical officer in order that he may recognize shortcomings, suggest subjects for future investigation, and generally adopt available means to practical ends.

Secondly, the annual report furnishes an opportunity of making recommendations to one's committee, or, better perhaps, of recording facts on which subsequent recommendations can be made.

Thirdly, the report will show the Board of Education how far their requirements are being met, and what special difficulties arise in various districts.

Lastly, the annual report can be used for publishing, original observations, though I am myself of opinion that most of such work is better reserved for the professional journals, instead of being interred in a volume of local transactions.

Possibly the ideal report would be one that contained a comparatively superficial survey of the whole field of applied school hygiene, together with a reasoned account of one or two of the problems which have specially claimed attention, or concerning which the medical officer is prepared to make definite recommendations. Thus a general account of

the school buildings might be accompanied with a special account of ventilation, methods of cleaning, desking, lighting and so forth, which in subsequent years might be dealt with.

Let us now consider the various details dealt with in Paragraph 6 of the Board of Education's circular.

Sub-section (a) is concerned with school buildings and their surroundings. The compilation of this part of the report will be assisted if a record of each school is kept on a convenient schedule. The card produced, which is accompanied by a block plan, is a sample of such a schedule.

Note should be made in this section of any schools opened or closed during the year, and of any uncommon features in the new buildings. Mention may also be made of any modifications in design which experience has suggested to the medical officer.

Sub-section (b) deals with the local organization, which should be described in detail. Mention may here be made of any defect in the local organization, and especially of the sufficiency or otherwise of the staff appointed for school work.

Sub-section (c) requires a statement of the number of children inspected, visits to schools and so forth. These figures can rapidly be obtained by simple analysis of the cards from each school. On this occasion all the cards must be examined. In subsequent years a dating stamp, with various coloured inks, can be used to mark the date of inspection, and will afford a ready means of selecting the cards which require analysis in future years. It should be possible for all the figures required for the annual report to be extracted before the schools re-open in January. Unless this is done, the annual report will be unduly delayed, and the current work of the inspectors interfered with. Should it be inconvenient to analyze the cards in batches during the last quarter of the year, the local authority should grant temporary clerical assistance during the Christmas holidays.

Sub-section (d) asks for a general review of the facts disclosed by inspection. As a full examination of each child is neither practicable nor desirable, a review of the facts disclosed by inspection can only have a limited statistical value. As far as the facts have been ascertained, they can, without much difficulty, be extracted by the preparation of tables such as that produced. The figures

must not, however, be taken for more than they are worth. Thus, if in the inspection of 1,000 children, ten cases of heart disease were discovered, it must not be assumed that this is the true measure of the incidence of cardiac disease. It may well be that many other children with heart trouble would have been discovered if every child had been fully examined under conditions favourable for clinical work. Personally, I shall not aim at completeness or finality in this table, and, like certain tariff reformers, be content to use the figures to illustrate my report. After all, to return to the example just given, the fact we want to drive home is not the percentage of children with abnormal hearts, but the fact that there are at least so many children requiring special treatment on account of rheumatic or congenital trouble.

Great caution will have to be used in comparing the returns from different localities as both the methods and opportunities of different medical officers will vary, but in any case a sufficient number of salient facts will be available to allow the school medical officer to point more than one moral. On the other hand it will be possible and desirable from time to time to make enquiries into certain points—e.g., the condition of the teeth, the frequency and associations of large tonsils; but if this is done each child must be inspected from the special point of view, and more time taken in the examination of the selected organs than is necessary, when a general view of the situation is the primary object.

In preparing the table of heights and weights, the number of children examined at each school has been noted. These have been grouped under age and sex, and the sums of the heights and of the weights entered in appropriate columns. By adding together the figures from each school, the average height and weight for the locality can readily be arrived at. It is also easy to work out the average height and weight for representative schools should that be wanted, though in many instances the number of observations would be too small to be of any value. As a matter of fact, I am doubtful whether the tables prepared for the whole district are worth the labour they entail, and I would like to see them replaced by more carefully compiled tables from selected schools, wherein the children were weighed more frequently, and the results correlated with observations as to health, diet, racial stock and so forth.

Sub-section (e) deals with the relation of physique to home and social conditions. No useful information is likely to be immediately available, but this subject would obviously afford scope for a special investigation in future years.

Sub-section (f) refers to the means employed or available for treatment. This should be dealt with in detail in an early report. The first preliminary to the satisfactory organization of treatment is a clear understanding of the extent and limitations of the opportunities already available. Obviously, therefore, an account of the medical charities, dispensaries and clubs of the district is an essential preliminary to a survey of the medical needs of the school child.

The matters referred to in the concluding sub-sections of Paragraph 6 do not call for any special comment.

Finally I would urge that the annual report should appear in good time, and err on the side of brevity, if it is to be read and digested by those to whom it is addressed.

INFANTILE MORTALITY — VOLUNTARY VISITORS' ASSOCIATION IN GLASGOW.—In connection with infant mortality in Glasgow there is in the process of formation a new organization to be known as the Glasgow Infant Health Visitors' Association. A provisional committee have already approved of the following constitution:—

1. The name of the Association shall be "The Glasgow Infant Health Visitors' Association."
2. The membership shall be open to all who are in sympathy with its aims and objects.
3. The aim of the association shall be to co-operate with the Corporation of Glasgow in its efforts to reduce infantile mortality of the city (1) by providing visitors, who will undertake the regular visiting of all infants who may be notified to the association by the Department of Public Health as requiring supervision, and the regular monthly reporting of same to the medical officer of health; (2) by organizing such other means for improving the health of mothers and infants as may appear advisable.
4. The visitors and workers of the association shall be voluntary (and unpaid). They shall be ladies who are qualified to advise the mothers in the proper care of their infants, and who will undertake (themselves or by competent substitutes) the visitation of the infants assigned to them.
5. For the work of the association the city shall be divided into districts or local centres corresponding as far as possible to the municipal wards; but wards in which the number of infants requiring supervision exceeds 350 per annum shall be sub-divided to form districts or local centres.
6. Each local centre shall have a lady president, a vice-president, and an honorary secretary, who, with representatives of each department of its work, shall form the local centre executive.

THE CONTROL OF THE MILK SUPPLY.*

By L. M. BOWEN-JONES, M.R.C.S., L.R.C.P., D.P.H.,
Medical Officer of Health, Carmarthen Urban and
Rural Districts.

I SHALL take it for granted that there is no scope for difference of opinion upon the grounds that milk conveys disease at times to the consumer; that milk is most dangerous to health in the hot months, and that then the danger is conveyed in the medium of dirt which is allowed to contaminate it; that this dirt is generally speaking throughout the year far in excess of what it need be; that whereas the risk of the spread of tuberculosis through milk is considerable, and calls for further safeguards, the more urgent need is the greater cleanliness of the milk supply; that it is in the interests of the trade that the milk supply should satisfy a legitimate demand for the greatest possible purity, and that it should cease to be regarded as a not infrequent danger to health, and that the confidence of the public in the safety of the milk supply should be established and maintained; and further that a milk-born epidemic of disease is such a great disaster to the milk dealer, that every available measure to guard against it should be taken.

Although the dirt in milk is responsible for much infantile mortality, in the summer months more particularly, my own belief is that even more children die from the want of this necessary article of food; so that the milk trade is one which it is in the public interest to foster and protect; but public health interests demand a greater guarantee of healthy cows, a sufficient standard of cleanliness of milk, and the discontinuance of the very general practice in summer months of drugging it with chemical preservatives.

It is a circumstance for which, in my judgment, the dairy trade and the medical profession are conjointly responsible; that there is a general lack of that co-operation towards the attainment of an end which it is their mutual interests to strive for. This circumstance is checking much towards the goal of a purer milk supply. It is explained on the one hand by the unreasonable and impracticable demands often made by members of the medical profession, not excluding that section

which officially advises sanitary authorities, and on the other hand by the opposition often shown by the trade to measures that are practicable and necessary. The enlightened precautionary measures which have been adopted by many of our best dealers are a sufficient acknowledgment that much ought to be done, and can be done to safeguard the public health interests of the community, but is still left undone by the many; and what is now wanted is a lead from the trade, through its representative organization, to help to bring about a general improvement on similar lines. I can conceive that it would be a most valuable and politic step, for small local associations of dairymen to formulate their own suggestions and advice to the trade, as to the best available means of improving existing conditions. It would be valuable and politic for the following reasons: In the first place it would convince those outside of the trade, who now include an army of hostile critics, that the trade is not careless as to its great responsibilities, and by laying down a practical scheme of suggested improvements it would offer a safe basis for reforms on which legal and administrative measures could be constructed, seeing that the trade itself had pronounced in their favour. Any suggestions for improvement which the trade advocates can then be advocated by the Public Health Medical Service with treble effect, and if such organization could see its way to appoint a committee to frame such detailed suggestions, and to ask one or two representative medical men to join that committee in its deliberations, I am confident that results would follow from which the trade and the public would mutually profit. Can this be done?

The larger milk vendors have in their contracts with farmers, and in the safeguards adopted by themselves made many noteworthy advances during recent years, and these might well serve as a basis in the construction of recommendations to the trade generally. These have all stood the test of practical application, and what has been achieved already by the more progressive section of the trade should be demanded of the other section. It is not sufficient that one section of the community should be under some measure of protection while the other is neglected.

The milk trade must realize to the full that theirs is unique amongst trades, inasmuch as it deals with a necessary article of food which

forms almost the exclusive diet of a large proportion of the most susceptible units of the population (the infants and invalids), and milk is unique as an article of food in its powers of collecting and fostering micro-organisms which are injurious to health, and may be fatal to the infant consumer. To quote Professor Axe, F.R.C.V.S.: "As a medium of the dissemination of the seeds of infection, milk stands foremost in our common articles of diet." It is, therefore, an extremely responsible trade, and it is an exceptionally difficult one to conduct. The public, enlightened and stimulated by those who guard their health interests, are demanding, with increasing concern, that those engaged in the milk trade shall do all that is possible to protect them. It is not an unreasonable demand, and those who fail to respond to it not only neglect an obvious duty which they owe to the community, but they show by the failure to realize their responsibilities their unfitness for the particular trade in which they have embarked. It is inevitable in the near future that they shall suffer from the consequences of their disability. It is the fit alone who will survive, and the milk trade will be generally raised to a higher standard of ideal and accomplishment. Having regard to the vital importance of the issues, you cannot blame medical men and sanitary authorities for having taken somewhat extreme measures for securing that which the trade as a whole has not yet been able to supply. It is not for the trade to complain; it is for it to remove the grounds for their complaint. If this is not done, the remedies which lie to the hand of sanitary authorities will have to be more fully and generally availed of. The stringent milk legislation in force in the United States of America is already foreshadowed in the special Acts of Liverpool, Manchester, Sheffield, etc., in reference to bovine tuberculosis, and in the London County Council General Powers Bill, 1907. The municipal milk supply advocated by some on the grounds that plenty of milk is a primary necessity of the community, and that the trade will not supply it in a sufficiently pure condition, has already been partially realized, and the municipal model farm, the municipal milk depot, etc., are, after all, only the outcome of the trade's failure to appreciate public need. The National League for Physical Education and Improvement (representing the highest medical and

scientific opinion of this country), The Infants' Health Society, the National Health Society, etc., are all pressing the powers that be for reforms. The big milk companies, who have the foresight and acumen to read the times aright are profiting handsomely from the exceptional precautions which they take in the interests of their customers. But it is not sufficient that a few should do this, there must be an advance all along the line, and we cannot rest content while any lag behind to prejudice the health interests of the community. Medical practitioners, moreover, are very alive to the existing dangers, and are advising families more and more against the consumption of raw milk, and in many homes the time and trouble involved in boiling milk, and the extra price generally demanded for sterilized milk, are factors which help to swell the already enormous consumption of condensed milk. Surely, then, the trade must ensure a satisfactory milk supply, and it is not too much to ask that its representative association should no longer sit on the fence, but should give the lead by laying down their own suggestions for improvement, and by assisting in the earliest possible realisation of these suggestions.

It has often impressed me, as a most discreditable circumstance in our sanitary administration, that the legal powers which it is competent for any rural sanitary authority to execute, have either been so ignored or badly administered that, in the rural districts where the bulk of our milk comes from, there exists practically nothing worthy of the name of a sanitary supervision of dairy farms. In consequence, the larger milk dealers have had to step into the breach, and, in order to protect themselves and their customers from the consequence of the neglect of the proper authorities, that have taken upon themselves these duties; and it is no exaggeration to state that the requirements and conditions imposed by up-to-date milk vendors under their contracts with the farmers, furnish an object-lesson of what can, and ought to be done, to the best organized and most advanced rural sanitary authority in this country. But this is an unfair tax on the milk trade, and if the rural sanitary authorities did their duty it would be unnecessary. From information obtained in 1903 by the *British Medical Journal* from medical officers of health of counties and combined sanitary districts, it appeared that in England and Wales, as a

* Presidential Address delivered to the West of England and South Wales Branch of the Society of Medical Officers of Health October 15th, 1908.

whole, some 30 per cent. of the sanitary authorities had made no regulations under the Dairies and Cowsheds and Milkshops Order, 1885. That very few of those who had made regulations had provided efficient means for the supervision which is necessary to ensure that they are carried out. That under the Order of 1889 (for dealing with tuberculosis of the udder) only four had arranged for any measure of veterinary inspection of milch cows.

All local authorities should be compelled to adopt these regulations, and the Local Government Board should appoint inspectors to see that these are enforced, and, if not, should have the power of acting independently of sanitary authorities.

Although I believe that the bulk of the milk of this country is still sold by the small retailer, the past few years indicate the drift of future events, by the circumstance of the development of increasing numbers of large supplies. In comparison with the methods adopted by the larger companies, the small tradesman is often and necessarily so at a disadvantage, and if, in the course of this natural evolution of the trade such an important and delicate branch of industry passes out of the hands of many of the smallest dealers now engaged in it, and becomes absorbed by larger businesses, capable and willing to make suitable provision, then so much the better. I should add that I do not mean this statement to apply to all small retailers, because I know of many who have recognized the necessity and found it possible to deal with the milk in a manner which loses nothing by comparison with larger supplies, but the increased stringency of future requirements will inevitably make it more and more difficult for the smaller men to compete with the larger organizations, which are able to face somewhat increased working expenses and thrive on a smaller margin of profit. But they should not only initiate their own scheme of reform, because such reform is demanded, and is in the interest of the trade, but also because their own scheme would tend to shut out others, which are not always as reasonable and practicable as could be desired. Above all they should include an educational campaign in their scheme. The country dairymen are often very conservative of the old and careless methods of their forefathers, and it is only to the dicta of their trade organization

that they will turn an ear. The better class dairymen have done much to educate their own farmers, and would they not do well, as an association, to do the same, and publish detailed dairy rules as approved by them, somewhat of the nature of those issued by the United States Department of Agriculture, 1900, and founded on the advice offered in the published leaflets of our own Board of Agriculture.

Difficulties having been experienced, under conditions of most elaborate precautions, in obtaining germ-free milk for laboratory test purposes, I realize that under no conceivable conditions can we hope in general practice to collect milk which is not planted with many hundreds of micro-organisms to the c.c.; but the fact remains that by greater efforts to reduce the number of organisms which now get into the milk at the time of collection, and by preventing those from unduly multiplying in the interval of collection and distribution to the public, we should achieve a great and most valuable improvement in the keeping powers and purity of the milk. It is this improvement at the source which is so much demanded, for the excessive contamination there either handicaps or nullifies all the subsequent precautions which may be taken.

The germs in milk gain access through dirt. I will undertake, by the exercise of a little ordinary cleanliness (the details of which shall involve no extra expense, and shall not take me many minutes to execute) to milk a cow so that the dirt germs shall be reduced 50 per cent. below those in the milk of the animal milked in the next stall under the usual conditions. It is the number of these dirt germs and the opportunities afforded to them for multiplying that determine the keeping powers of the milk, and its safety or danger to infants; and it is the best farmers who supply milk that will keep.

The germs, once in the milk, nothing at the farm premises will separate them. The strainer or filter will separate coarser dirt, but not the tiny germ, a regiment of which could pass through the smallest pores of the finest milk strainer. The most that can be done when once they have gained access is to prevent them from multiplying by cooling the milk immediately after it is drawn, to a temperature as much below 60° F. as possible, and to adopt increased precautions to prevent the temperature subsequently rising above 60° F. More or less efficient cooling pro-

vision is made nowadays at most dairy farms, but the full churns are still generally taken to the railway station in open carts unprotected from the sun's heat; advantage is not always taken of the railway company's concession for the use of sealed churns; there is a need for the provision of special milk cars on most of our railways; and when the churns arrive at railway junctions, one finds no cool sheds provided in which they can be placed for the possible hour or so of their broken journey; indeed, they are generally left fully exposed to the sun on the open platform, and the good fruits of the previous refrigeration are enormously discounted as a consequence.

All along the line, therefore, there is need for reform and for reforms, which the trade itself should initiate. But although I am confident of great advances in the near future, I do not expect to see such a measure of improvement as would lead me to recommend the feeding of infants with raw milk, more especially in the summer months, when pasteurisation appeals to us as a measure of enormous public health value; and as the contamination of the milk in the home is a circumstance which, in my opinion, is responsible for much of the evil consequences of the consumption of raw milk in the summer months. I am confident that before long all milk will be sold in bottles. This represents an important advance in the right direction, when the proper means are provided and the necessary precautions taken for thoroughly cleansing the bottles and filling them at headquarters.

The greatest difficulty which confronts us is the ignorance at the fountain-head—the average country dairy farm.

The majority of dairy farmers have made little educational advance during recent years in their appreciation of the necessity of greater care and better provision for guarding the cleanliness of milk, and the actual milkers have rather deteriorated than improved with the greater difficulty experienced in obtaining that class of labour. I am told that in Denmark there is greater intelligence and better supervision exercised over the milkers by the Danish dairy farmers compared with this country.

The more backward British dairy farmer will, like the Dane, improve under the stimulus of a sufficient supervision and inspection, and by the insistence by those, whom he supplies, of a higher standard of cleanliness of the milk.

When a churn of milk is returned to him because it has become sour by the time it reaches its destination, he is, in my experience, seldom disposed to take this as a lesson in the necessity for greater precautions for cleanliness, but more often concludes that it is an excuse on the part of the consignee to get rid of some surplus milk he does not require. It would be a good thing if a simple limit of dirt could be fixed which, when exceeded, would warrant its condemnation as dangerous for use; the consignee would return milk, and the farmer would then soon learn the lesson of the necessity of greater cleanliness, and where neither he nor any member of his family assisted in the milking operation, he would find it to his interest to at least exercise the necessary supervision over those that do the work. To put it mildly, too often only the most rudimentary precautions are taken at the fountain-head, and the slovenly methods of the past must make way for more cleanly ones which involve the minute attention to detail which comes with an educated cleanliness. The state of filters and strainers after use is eloquent testimony to the need for reforms, and if these are not forthcoming, the means will be devised for enforcing them. The London County Council has decided to apply to Parliament for powers which would make, subject to a penalty, the sale of milk which is found after examination so contaminated as to be dangerous to health; and the suggestion for a bacteriological standard has met with a wide approval, and is one of the possibilities of the near future.

Excessive bacteria imply excessive dirt, and dirt is as bad as adulteration, if not worse; and it is the sole *raison d'être* of chemical preservatives.

I believe that you will agree with me that another very necessary reform is the annual licensing of all premises where milk is either sold or collected or prepared for the purpose of sale. This has already received legal sanction in the Liverpool Improvement Act, which dates as far back as 1867. The conditions of the initial grant of the license must be the suitability of the premises, and the sufficiency of the general arrangements for the important purpose to which they are put, and the annual renewal conditional upon the maintenance of these at a satisfactory sanitary standard. There is already a precedent for this in the annual licensing of slaughter-houses, and none will dispute the greater

claims which may be urged in favour of licensing dairies and shops where milk is sold. The provision would, of course, apply to dairy farm premises, none of which should be licensed unless there is an easily available supply of pure water, sufficient in quantity all the year round; unless there is a separate boiler in which abundance of boiling water can be prepared for scalding purposes; and unless adequate arrangements exist for cooling the milk; and under its operations it is to be hoped that milk will no longer be sold in shops fully exposed to dust and flies, and more particularly in such places as chandlers' shops.

Such a requirement would not hit anyone who was conducting the business with due regard to the bare necessities of the case, but it would eliminate a few from the trade who should not be allowed to continue to carry it on to the public danger. It is not necessary that the premises licensed should be structurally elaborate. Elaborate cleanliness is what is wanted, and the means for maintaining it, and the evidence of a conscientious and intelligent effort to secure this should determine the granting and renewal of such licenses. Where structural improvements are required at the farms, the owner should be compelled to execute them, and he might add a 5 per cent. interest on his outlay to the rent.

The arguments in favour of the frequent veterinary inspection of cows, the milk of which is used for human consumption, whether as milk, cream, or butter is overwhelming. The inspection is more particularly necessary as a precaution against the spread of tuberculosis. Veterinary authorities are agreed that some 20 per cent. of milch-cows are tuberculous, and that about 1 to 2 per cent. of these have tuberculous deposits in their udders. It is not surprising, therefore, that of the dairy samples of milk taken in our large towns and examined, over 10 per cent. of these have been found to contain the tubercle germ.

The present Royal Commission, as the result of a mass of most painstaking and exact experimentation, unanimously conclude that the human and bovine diseases are caused by the same germ, and are therefore intercommunicable; and this is the conclusion of practically all living experts, Koch and a few followers being the sole exceptions.

I am of opinion that the number of cow

diseases which have been alleged to be communicable through the milk to human beings has been greatly exaggerated. There is an udder disease, the clinical symptoms and bacteriology of which mark it as a form of "garget," which is convicted from a mass of strong circumstantial evidence, as the cause of alarming outbreaks of throat illness, examples of which some of you may possibly have experienced.

It seems to me that local associations should give the impress of their authority in favour of this inspection, and that they should consider and decide upon the practical details of a scheme that would be acceptable. I believe you will agree that such an inspection cannot be provided by the rural and small urban sanitary authorities for many reasons, and it certainly would not be fair to saddle all the expenses involved upon the dairy districts. Failing these authorities, the duties would devolve upon the county councils, and failing them, upon the Local Government Board or Board of Agriculture. Personally, I should favour a system of a quarterly inspection under one of the latter boards, and I would give them power to act quite independently of the local sanitary authorities; but some fair measure of compensation should be provided (as under the London County Council General Powers Act, 1904), when animals infected with tuberculosis have to be removed from the herd and slaughtered. I am out of sympathy with the antagonism evinced in many quarters against a fair measure of compensation in such a scheme. The cost, having regard to the important issues at stake, is small, and would tend to grow smaller year by year, and without it the scheme of veterinary inspection will be under a great disability. Under most milk contracts with farmers, the farmer is exempted from any loss which might result from his giving prompt information of the existence of infectious disease in anyone connected with the cows and the milk. This is found to be a valuable concession as guaranteeing that the necessary information will not be withheld; it is for a similar reason that I advocate compensation for the compulsory slaughter of the milch cow, and my advocacy is strengthened by the circumstance that the diagnosis of tuberculosis is often very difficult. I would not advocate a full measure of compensation, for some loss upon a tuberculous animal will serve as a stimulus to many farmers to be more careful what they

buy, and to do more (especially in the matter of the ventilation of the sheds) to keep their cows free from this disease. To further the ends of this necessary veterinary inspection, it is not too much to require that farmers should be compelled, under a penalty, to notify any udder disease in a milch-cow, and to refrain, temporarily, from mixing with the other, milk that is drawn from a diseased udder, pending the veterinary inspection. The scope which at present exists for reduction of tuberculosis in bovines, without seriously interfering with the conduction of the trade, or increasing the cost of the milk to the public, is demonstrated by the operation of the London County Council and Manchester Corporation Milk Clauses. The operation of the latter Act having reduced the number of tubercular samples sold by over 40 per cent.

With these observations I conclude my address, and I do so in the hope that you will recognise that, in the statements I have made, in the opinions I have expressed, and in the suggestions I have ventured to throw out, I have been actuated by one desire, and that is to do something that may assist us in our common interests as guardians of the public health.

MIDWIVES ACT COMMITTEE.

The Lord President of the Council has appointed Francis E. Fremantle, Esq., M.B., F.R.C.S., M.R.C.P., Medical Officer of Health for the County of Hertford, to be a member of the Committee appointed to consider the working of the Midwives Act, 1902.

WHITE PHOSPHORUS MATCHES PROHIBITION ACT 1908.—The Home Secretary has called the attention of grocers, tobacconists and other retail dealers in matches, to the provision in this Act under which it will be illegal after the 31st December, 1910, for any retail dealer to sell, or to offer or expose for sale, or to have in his possession for the purposes of sale, any matches made with white or yellow phosphorus. Any such matches in the possession of a retail dealer after that date, for the purposes of sale, will be liable to be forfeited.

THE MILK CLAUSES OF THE LONDON COUNTY COUNCIL (GENERAL POWERS) ACT, 1908.*

By W. A. BOND, M.A., M.D., D.P.H.,
Medical Officer of Health, Holborn.

IN accordance with the above, any sanitary authority in London may remove from the register of cowkeepers, dairymen or purveyors of milk, or may refuse to enter upon such register the name of any person proposing to carry on the trade of a dairyman or purveyor of milk, upon premises which are, in the opinion of such sanitary authority, for any reason unsuitable for the sale of milk therein. Provided that for the purposes of this section premises shall not be deemed to be unsuitable for the sale of milk therein on any ground inconsistent with the provisions or requirements of any order or regulation made under any enactment for the time being in force and applicable to such premises.

We shall probably have much difficulty in many cases in deciding what premises may be fairly considered "unsuitable," especially taking into consideration the fact that any dairyman may appeal within twenty-one days to a court of summary jurisdiction.

Many of us think that this question is a very suitable subject for discussion, particularly bearing in mind the desirability of securing uniform action, and I therefore agreed to open one on the subject.

I wrote to all the metropolitan medical officers of health and to the medical officers of health of eight of the largest towns in England and Scotland asking if they would kindly let me know what businesses, or particular articles sold in premises used for the sale of milk, they considered should render such premises unsuitable for the sale of milk therein, and what other causes they considered should render premises unsuitable for the sale of milk. I have tabulated the replies received, copies of which are laid on the table. In the case of the large towns in England and Scotland I also asked for copies of any special milk clauses and for information respecting prosecutions.

The replies are very varied. The main points that have to be considered are the liability of the contamination or infection of milk due to other businesses that are also

* Read to the Metropolitan Branch of the Society of Medical Officers of Health, on November 27th, 1908.

engaged in, or to bad structural or insanitary conditions of the premises. I think it will help us if we consider what action has actually been taken in some of the larger towns.

In Liverpool, the sale of coals, greengrocery, tobacco, chandlery and mixed general goods containing grease, or articles with a strong smell, or liable to cause dust, are apparently prohibited. On the other hand, such things as mineral waters, confectionery, and small groceries are allowed to be sold on milk premises.

In Manchester, successful prosecutions have been instituted against persons who were also greengrocers (where vegetables are sold having earth adhering); also for paraffin oil, dirty shops, dirty utensils, dusty milk, defective structures, and defective closets.

In Manchester, purveyors of milk have also to sign an undertaking to keep their milk cooled during the whole of the warm season, from May 31st to October 15th, by placing the counter milk vessel inside an outer one containing ice, or by some other effectual means.

In Glasgow, the sale of vegetables, fruit, fresh meat and fish is prohibited in any premises in which milk is stored and sold by retail. The bye-law under which they work is as follows:—

"No purveyor of milk, and no person selling milk by retail, shall carry on within his registered premises any trade or business which is of such a nature that its continuance would tend to contaminate the milk."

It is considered that more specific powers are required.

In Edinburgh, the regulations contain the following provision:—

"No purveyor of milk, or person selling milk by retail, shall carry on within the premises where he purveys or sells milk any trade or business which is of such a nature that its continuance is likely to cause contamination of the milk."

A prosecution was instituted in 1895 against a general provision dealer who was charged with retailing milk in a shop in which ham, cheese, groceries, firewood and other articles were sold. The contention of the respondent's agent was that this regulation was *ultra vires* of the complainers, who, it was said, had exceeded the powers conferred upon them by

the Privy Council Order of 1885. This contention was upheld by the Sheriff, who, on the merits, said that the local authority had allowed their zeal to outrun their discretion, and that they were not entitled, under cover of a bye-law or regulation such as that, to interfere with the liberty of the subject and prohibit sellers of milk from carrying on a lawful trade or business merely because, in the opinion of the local authority, their continuing to do so might possibly tend to contaminate the milk which they supplied to some of their customers. Upon the ground stated it seemed to him that a conviction could not competently follow upon that complaint. He was of opinion that the complaint was incompetent and irrelevant, and that it must be dismissed. He awarded five guineas of modified expenses against the local authority.

In Edinburgh, several convictions have, however, been obtained in cases in which clothes have been washed or dried in premises where milk was stored, or where milk vessels were washed, and also where premises used as sleeping apartments, have communicated with dairy premises.

I think there is no doubt that public opinion respecting the conditions required for milk has in recent years advanced considerably. For instance, prior to the year 1900, when it became the duty of each borough council to enforce the regulations for the time being in force with respect to dairies and milk shops, the London County Council did not require any cover for the milk counter-pan. In Holborn we began by requiring at least a muslin cover, and since 1905 we have required a metal cover. Even this is not an ideal form of cover, as even when only part of the cover is made to open, it is frequently left open. It is, therefore, very desirable that milk should be sold from vessels provided with a tap or some other protected outlet which would not involve removing the cover of the vessel, as recommended by Manchester. I would add that there also ought to be a "mixer" passing through the centre of the cover so that the cream can be kept properly mixed with the remainder of the milk. The counter-pan might also be kept in a receptacle made of glass or some other material with one side made to open. If this method were adopted it would only be necessary to remove from, or refuse to place on the register a limited number of dairymen.

I am glad to mention that this opinion was confirmed by Professor Kenwood, Medical Officer of Health of Stoke Newington, who sent me the following reply:—

"If milk is kept in proper receptacles and kept covered, the only premises which I should consider unsuitable for the sale would be those upon which a considerable amount of odour is associated with the business, such as in oil or fish-shops; also old clothes shops, because of the possibility of the presence of infectious organisms. If milk receptacles are not kept covered, there are few premises which are suitable for its sale."

Adequate provision must also be made for keeping the counter-pan, and other utensils used for milk, thoroughly clean.

It is very desirable that milk should be delivered from farms and from wholesale dealers only in churns which are practically dust proof. A dairy supply company in Holborn is now supplying such churns. A formerly deep-rooted opinion amongst dairymen that it was necessary for milk to be kept freely exposed to the air is gradually being eradicated.

It is, moreover, of even still greater importance that at farms and cowhouses there should be increased power of enforcing precautions required for preventing contamination of milk and securing the proper cleanliness of milk utensils.

FARM SANITATION.—"On November the 20th, I inspected M—— Farm, Walton-le-Dale. The farmyard and surroundings were in a most insanitary condition. The farmer keeps a large number of pigs, and on the date of my visit he informed me he had sixty-four. Fourteen boars and sixteen sows he keeps for breeding purposes. These are fed on diseased beef which he brings to the farm after the beasts (cows or horses) have been slaughtered. The young pigs do not get any of the beef. The boars are kept in an enclosure with a sty slightly raised above the ground. The enclosure is filled with manure, over which the animals walk about up to their bellies in semi-liquid filth. The styes occupied by the younger pigs have no drains. The cesspool in the middle of the yard was full, with the result that all the drains that empty into it had backed up and flooded the place. There was a dead cow in one of the stalls that had died from tuberculosis. The dairy is a dark, damp cellar, and in no way adapted for the purpose."—(Special report by Dr. Robert Trimble, Medical Officer of Health, Walton-le-Dale.)

MONTHLY NURSE OR MIDWIFE.*

By H. HANDFORD, M.D., F.R.C.P.,
Medical Officer of Health, Notts County Council.

THE subject of this discussion may at first sight appear trivial and unimportant, especially to those who have not carefully studied Sections 1 and 10 of the Midwives Act, and the Rules of the Central Midwives Board. The Local Supervising Authorities under the Midwives Act are in most instances county councils and county borough councils. Consequently, there are many medical officers of health, and a still larger proportion of medical practitioners, to whom the Midwives Act and the Rules of the Central Midwives Board are of little interest. But I think I shall be able to show you that it is of great importance to decide whether a woman is acting as a monthly nurse or as a midwife, and in the year 1910, that importance will be very widely extended.

The Midwives Act has not been welcomed by the medical profession, and they have certain very definite grievances of which they rightly complain. In most instances these grievances cannot be remedied without an amending Act. And yet no one who has been engaged in carrying out the Midwives Act, with all its imperfections, can doubt that it must prove of very great advantage to the country.

It will be easily understood that an Act of this kind was required, when it is stated that there is reason to believe that at least 60 per cent. of the births in England and Wales are attended by midwives; and it is known from the report of the Registrar-General for the year 1906, that in England and Wales 4,944 women died from causes associated with pregnancy or childbearing. Of these deaths 1,640 were due to "puerperal fever," which is a preventable disease. It cannot be doubted that many of the other deaths also might have been prevented by greater skill and care.

The Midwives Roll for 1908, contains 25,648 names. The majority of these are practising as midwives. A large number are acting as monthly nurses. The remainder, amounting to several thousands, are not practising at all.

Every certified midwife, before holding herself out as a practising midwife or com-

* Read before the Midland Branch of the Society of Medical Officers of Health, December 3rd, 1908.

mening to practise as a midwife in any area, is required by Section 10, of the Midwives Act to give notice in writing of her intention so to do to the Local Supervising Authority. She then has to carry out the Rules of the Central Midwives Board which are very detailed, very precise, and show evidence of having been drawn up with remarkable knowledge, experience and judgment. But although a woman is certified, and is on the midwives roll, and has notified her intention to practise as a midwife, she not unfrequently takes cases in which she acts as a monthly nurse under the direction of a qualified medical practitioner; and in such instances she is freed from the obligation to observe a considerable number of the Rules of the Central Midwives Board. It is very important, therefore, that an authoritative decision should be given to indicate what constitutes acting as a midwife, and when a woman is acting as a monthly nurse.

By Section 1, (2) of the Midwives Act, from and after April 1st, 1910, no woman shall habitually and for gain attend women in childbirth *otherwise than under the direction of a qualified medical practitioner*, unless she be certified under this Act. In 1910, therefore, it will be very important to know what constitutes acting under the direction of a qualified medical practitioner.

It has been the custom to consider that where a doctor is engaged to attend a woman in labour and a midwife also attends, the midwife is acting as a monthly nurse under the direction of a medical practitioner, and is exempt from most of the Rules of the Midwives Board. This is unsatisfactory in many respects:—

1. In about 30 per cent. of such cases attended by thoroughly respectable midwives working for nursing associations, the doctor does not come till after the completion of the third stage of labour, and in a still larger proportion the doctor does not come till after the birth of the child.

2. In other cases where both patient and midwife are less scrupulous, there is no intention to send for the doctor, although he has been engaged, unless something goes wrong.

3. I am given to understand that at some of the training schools it is laid down that a monthly nurse should not make vaginal examinations, and this constitutes a sharp distinction between a monthly nurse and a midwife.

The mere fact that a doctor is engaged, even if he should happen to get his fee, cannot safeguard the interests of the patient if the doctor is not present during any part of the process of parturition. A case has come

under my observation where a doctor had been engaged, but had left the neighbourhood before the date of the patient's confinement and had provided no substitute; and yet the midwife claimed that it was a "doctor's case," and that she was acting under the direction of a medical practitioner. It seems to me, and I think many of you must agree with me, that *a certified midwife who attends a woman through all the three stages of labour and conducts all the necessary operations without the presence of a doctor is acting as a midwife*, and cannot honestly be understood to be acting under the directions of a qualified medical practitioner. It is well known that the directions frequently given by the doctor to the midwife or nurse, are: "Do not send for me if you can possibly help it, and do not send at night." And these directions are very widely followed. But they are in direct conflict with the Rules of the Central Midwives Board. In Rules 18 and 19 of the Central Midwives Board there are more than a dozen conditions on the occurrence of any one of which the midwife is required to advise that a qualified medical practitioner be sent for. When a midwife, over-estimating her own skill, disregards these rules, and attempts to deal with abnormalities by herself, serious consequences are very apt to result, and the penalties provided by the Midwives Board are severe. And yet the same woman may deal with similar emergencies if she is allowed to call herself a monthly nurse, and to claim that she is acting under the directions of a qualified medical practitioner. If it were the custom for the midwife, when a doctor is engaged, to be instructed to send for the doctor *more frequently and for slighter occasions* than those laid down in the rules of the Central Midwives Board, the importance of the question I have raised might be small; but the very opposite is the case, and the midwife is discouraged from sending for a doctor. There are many midwives who were originally placed on the roll as "*bonâ fide*," whose names have been taken off the roll and their certificates cancelled on account of drunkenness, misconduct and incapacity, but who are still practising as uncertified midwives. When they get into difficulties, a doctor is sent for and attends just as in the case of the certified midwives. There are in the County of Notts alone about 100 women, untrained and uncertified, practising as midwives without any control whatever except that exercised by the doctors, whom they may have occasion to send for at intervals. Only those who have had to administer the Midwives Act fully realize how scanty that supervision is. After April 1st, 1910,

none of these women will be allowed to practise habitually and for gain if it should be decided that they are acting as midwives. If, on the contrary, they are able to substantiate a claim that they are acting as monthly nurses under the direction of a qualified medical practitioner, the law, as it exists, will be unable to control them, and a class of uncertified midwives will be perpetuated. Hence the importance of what constitutes "acting as a midwife."

The Central Midwives Board by their Rule E 25, have decided that "nothing in this section (E) shall apply to certified midwives exercising their calling in workhouses or Poor Law infirmaries under the supervision of a duly appointed medical officer"; but you will observe that nothing whatever is said of exempting certified midwives who practise under the supervision of private medical practitioners. Many of those who have watched the operation of this rule doubt its wisdom; but it was forced upon the Central Midwives Board by the Local Government Board after strenuous opposition. Workhouses and their medical officers are under the control of the Local Government Board, and it is conceivable that difficulties might have arisen from the interposition of a new body like the Central Midwives Board, and that administrative difficulties might have arisen.

Again, if it should be claimed that in the class of cases I have described, the woman is not acting as a monthly nurse, but as a substitute for the doctor, under his directions, then, in view of section 1 (2) of the Midwives Act which comes into operation on the 1st of April, 1910, it is a matter of some urgency that the General Medical Council should consider whether or not such action comes within their definition of "covering."

It is not necessary for me to dilate upon the dangers and injury to health which may result from midwives, either untrained or with only the short training which is usually possible at the present day, undertaking unaided the complications and difficulties which the Central Midwives Board consider require the personal help of a fully qualified medical man. You know them quite as well as I.

Lastly, I am anxious for the honour of the medical profession that they should not, by taking too narrow a view of their own interest, help to prolong a condition of unqualified and

incompetent practice on the part of these women who have been already shown to be such a danger to the community. I think it might be wise for the Society of Medical Officers of Health to take some steps to induce the Central Midwives Board to express an opinion as to what constitutes "acting as a midwife." Such a delicate and complicated question cannot be satisfactorily determined in the ordinary courts of law, and yet it looks as if very few more years could elapse without the question being brought before the courts.

DISCUSSION.

DR. BOSTOCK HILL thought that it would be necessary to obtain the assistance of the police in enforcing some of the provisions of the Midwives Act. The matter of supervising certified midwives who were acting as monthly nurses, was one which should in some way be met; he thought that the Branch should take steps to bring the matter before the Central Midwives Board, so that their ruling on the matter could be obtained. He thought it possible that there might be some medical practitioners who habitually cover midwives, and thereby affect the honour of the profession. He was in some doubt as to how the matter could be best dealt with.

DR. ROBERTSON did not think that in Birmingham they would meet with the difficulties anticipated by Dr. Handford; through the Notification of Births Act, he was able to acquaint himself with every birth attended by a midwife, and he could therefore soon find if a midwife were being covered by a medical practitioner. If such a condition of affairs were found, it would be easy to get rid of it by one or two prosecutions. There was in Birmingham a large number of incompetent women on the register as midwives; in some other districts, some care had been taken not to allow such women to get on the register; in such towns the dearth of midwives would probably be felt. In Birmingham a training centre had been started, but they found that 80 per cent. of the midwives trained there went into outside districts.

DR. MALET thought that the difficulties would not be so great in the towns. With regard to the supply of midwives, his experience had been the same as that of many others, that where good trained midwives came in, they had not been able to make a living on account of the number already registered as certified midwives.

DR. ORTON bore testimony to the fact that in the country districts there was a great dearth of midwives; in some districts there were none at all; the diminution of midwives in those districts appeared to be due to the Midwives Act. It did not pay for a qualified midwife to live in a country district; he knew of a case where a woman's life was lost because there was no qualified person within several miles of the hamlet.

DR. GARRETT presumed that the whole question resolved itself into one of sufficient remuneration.

A district nurse would go to any district where there was sufficient money to be earned. In Cheltenham there was an institution for monthly nursing, and they did 68 per cent. of the work.

DR. BOSTOCK HILL stated that in Warwickshire he had suggested two or three years ago, that a certain number of scholarships should be given to women who applied for them; this suggestion had been acted on; these women had been put into certain districts, but being unable to make a living they were obliged to move into other districts. He thought it necessary to get the village nurse and the nursing associations to take part in the midwifery work.

DR. HANDFORD replied on the discussion; he said that very few of these women practising irregularly called themselves monthly nurses; and they knew that they could not call themselves midwives; he called them monthly nurses because he did not know what else to call them. They acted as midwives but claimed that they did not do so; "monthly nurse" seemed the only appropriate term. He did not think that there would be any great dearth of midwives in Nottinghamshire, as he had succeeded in getting most of the women already practising to become certified as *bonâ fides*. A certified midwife, doing midwifery alone, could not get a living in country districts; and had to do general district nursing as well. From his experience the police would be of very little help; they said that it was not their business. He thought that a good deal of trouble would arise in 1910.

THE PAYMENT OF THE FEES OF PRACTITIONERS CALLED IN BY MIDWIVES.—Medical assistance was required in 684 cases, which is 5.5 per cent. of the total confinements attended. The highest rate at which any one midwife required medical assistance was in 25 per cent. of her cases. In 227 cases, namely, 1.8 per cent. of the births attended by midwives, the patients were so poor as to be unable to pay for medical assistance, and the Corporation resolved to pay the doctor who was called in to help in the emergency. This action of the Corporation has undoubtedly been of the greatest service, both to midwives and their patients, who are thus enabled to obtain prompt medical attention in times of emergency. The fee is limited to one guinea, and in many cases part of the fee was paid by the patients themselves, and only the remaining portion paid by the Corporation. (*Annual Report of Dr. E. W. Hope, Medical Officer of Health, Liverpool.*) "As regards the payment of fees to medical practitioners, under the scheme outlined in the report for 1905, 288 applications were received during the year. These were considered by the medical sub-committee, and they recommended that payment should be made in 239, amounting to £247 10s. Of the forty-nine cases which were rejected as not fulfilling the conditions, in twenty-six instances the income was above the scale, whilst nineteen were not cases of emergency for which the fee is paid." (*Annual Report of Dr. James Niven, Medical Officer of Health, Manchester.*)

THE FIFTH REPORT OF THE ROYAL COMMISSION ON SEWAGE DISPOSAL.*

AN IMPRESSION.

By GILBERT J. FOWLER, D.Sc., F.I.C., F.R.San.I.

THE long expected document is at last before us, and the more one studies its closely packed pages, the more difficult becomes the task of useful criticism. Any one of the numerous questions dealt with would afford material for a prolonged discussion, while no good purpose is served by dwelling on points of detail which, as the Commissioners continually point out, must vary from case to case. My endeavour will, therefore, be to deal as broadly as possible with the more important general considerations which arise out of the findings of the Commission. Even thus the value of individual criticism must be conditioned by personal experience. In the nature of things this must be more limited, in certain directions at any rate, than that of a Commission before whom so many witnesses have given evidence, and whose own labours and observations have been so extensive.

It will be understood, therefore, that any criticisms which follow are made with the object of awakening interest in, and, if possible, of increasing the usefulness of a report which embodies the results of so many years unremitting work.

In the first place, one feels that the report is unnecessarily empirical. It is true that our purely scientific knowledge of many points which arise in connection with sewage purification is still extremely limited, and it may therefore be argued that to systematise the results of experience is more likely to be useful than to build up conclusions on an imperfect basis of theory. At the same time sufficient is surely known of the fundamental facts underlying the processes employed to indicate the limits within which the conditions of success or failure must be sought.

Thus, to take the case of septic tanks, a large amount of accurate scientific information as to the conditions of fermentation of cellulose, fats and nitrogenous matter exists, little of which is referred to in the report. Consequently, in discussing the rate of flow through the tanks, scarcely anything is said as to its

*Read at the Meeting of the North-Western Branch of the Society of Medical Officers of Health on November 27th, 1908.

dependence on the concentration of the sewage, or of the different rates at which fermentation proceeds in the dissolved and deposited matters respectively. According to circumstances the volume of sewage may, according to my experience, vary from five gallons to 200 gallons per head. Cases arise, especially, *e.g.*, in schools and public institutions and in sea-side towns, of great variations in flow from hour to hour or at different periods of the year.

Some definite information as to what is actually taking place in the tank is surely of more value in designing such works than a mere statement of the number of hours during which the sewage should remain in the tank, however many cases such a statement may cover.

Again, no doubt, it may be true that in a large number of cases effluents from sedimentation or chemical precipitation processes can be purified on bacterial filters equally as readily as a septic tank effluent, for the reason that in most town sewages ammoniacal fermentation is well advanced by the time the sewage reaches the works. It is nevertheless a necessary preliminary to nitrification*, and in the case of very "fresh" and concentrated sewages the incompleteness of preliminary ammoniacal fermentation will certainly make itself felt in the filtration processes.

Similar absence of fundamental guidance is noticeable in relation to filter beds. Some clear thread of principle, however slight, would appear to me to be of greater value to practical people than a large number of empirical results, continually qualified by reservations.

And here one may point out a possible serious danger, viz., that the uninstructed reader will ignore the reservations so plentifully scattered up and down the report, and easily noted by the trained eye, and fasten on some conclusion in harmony with his pet ideas to the exclusion of everything else, and thus impose a further tax on the patience of responsible advisers.

Such a result, I am sure, is far from what the Commission would wish to bring about.

Coming now more definitely to consider the various sections of the report, pp. 18-23 are taken up with a discussion of different preliminary methods of treatment for the removal of suspended matters, viz., sedimentation

* In the writer's opinion the balance of evidence is in favour of this view, although it is contested by Dunbar—"Principles of Sewage Treatment," p. 160.

tanks, septic tanks and chemical treatment, and the general conclusion is drawn that "there is very little difference in annual cost between the various methods of tank treatment when taken in conjunction with the subsequent cost through percolating filters, assuming that the kind of filter adopted in each case is that best adapted to the particular tank treatment provided."

Here, at once, a considerable assumption is made because the levels, the material available for filtering medium, and other conditions may not lend themselves to the construction of filters suited to the tank treatment which is called for by other conditions relative to sludge disposal.

Thus, for example, the conditions above mentioned as regards filters may call for the provision of shallow percolating filters of fine grade. These, on the other hand, require an effluent as free as possible from suspended matter, and thus necessitate a large production of sludge in the tanks, while it may be that the conditions as regards sludge disposal are particularly unfavourable, and a large production of sludge would entail great inconvenience and cost.

In dealing with sludge generally, the report appears to consider too exclusively the quantity produced, apart from its physical and chemical characteristics. The great objection to chemical treatment, apart altogether from the cost of chemicals, appears to me to be the production of large quantities of a sludge which is costly to deal with owing to its high water content and consequent excessive volume, and also especially difficult to dispose of owing to its high proportion of greasy matter. It is chiefly because of the grease present in ordinary pressed cake that the latter is not more readily taken by farmers, as it does not quickly incorporate with the soil. It is somewhat extraordinary that in agricultural experiments with various kinds of sludge cake, mentioned later on in the report, no attempt was made to determine the agricultural value of the deposit from percolating filter effluents, or the "slurry" washed from the material of contact beds. Trials at the Manchester sewage works at Davyhulme have shown that the latter has a distinctly greater agricultural value than ordinary sludge cake owing largely, no doubt, to its freedom from grease and consequent greater friability.

In this connection, while they rightly refrain

from expressing decided opinions on a patented process, one feels that the Commission have done rather less than justice to Mr. Dibdin's slate bed by which, at any rate, he endeavours to provide a solution for the sludge difficulty.

Merely to insist on the removal of as much suspended matter as possible before an effluent passes on to a filter is to leave the sludge problem, in many cases much more serious than the filtration problem, quite untouched. Moreover, it must not be forgotten, as was proved long ago by Mr. Dibdin at Barking, that to carry clarification by chemicals beyond a certain very moderate limit entails a rapidly and disproportionately increasing cost, much as the coal consumption of a steamer increases disproportionately beyond a given rate of speed. This is especially the case the more dilute the sewage.

Coming now to the sections on filtration, interesting experiments are described which have been carried on by the Commission themselves at Accrington and elsewhere on the relative efficiency of contact beds and percolating filters, on the effect of dilution of the tank-effluent, of the depth of filter, of size and character of filtering material, etc.

In their discussion of the perennial question of the relative advantages of contact beds and percolating filters, one feels again that a less empirical method of treatment would have been more instructive. As a matter of fact, as has been pointed out by more than one observer, the contact bed and the percolating filter are in many respects essentially different types of machine. In the contact bed, broadly speaking, oxidation takes place alternately by nitrification during the "standing empty" period, and denitrification during the "standing full" period and, therefore, although less nitrate as a rule escapes from the bed it does not necessarily mean that less oxidation as a whole has been effected. Speaking generally, one would expect that dilute sewages containing comparatively little colloidal matter would be more specially suited for treatment by percolation, and strong sewages by the contact method. As a matter of fact, many engineers have recognised this, and works have been recently designed with a primary treatment on contact beds followed by final treatment on percolating filters. Such a method is likely to minimise two sources of nuisance to which the report rightly states percolating filters are liable, nuisance from smell owing to the spraying of offensive tank

liquor, and nuisance from flies. The chief source of the unpleasant white-winged fly so common on many percolating filters appears to me to be the accumulation of undigested suspended and colloidal matter and gelatinous growth which necessarily occurs immediately below the surface of high speed percolating filters. In a contact bed the colloids are fairly evenly distributed throughout the medium, and such areas of imperfect oxidation do not occur if the bed is properly worked. This overloading of the upper layers of coarse-grained percolating filters hardly seems to me to have received the attention it deserves. I have frequently heard it stated as a ground of objection to coarse-grained percolating filters that they actually produce more deposit than can be accounted for by the suspended and colloidal matter put on to them. I have reason to believe that this is the case, the lower portions of the filter constituting channels for semi-purified liquid to pass over, thus giving the ideal conditions for the growth of organisms such as "carchesium," etc. Gnat larvæ also appear to thrive abundantly at the base of such filters. Such troubles may be of little moment in small works, but in the case of beds covering many acres the fly difficulty generally is one which calls for very serious consideration.

Owing to the equable distribution of colloidal matter above mentioned, and also to the periodical complete filling, contact beds do not appear to produce flies, and fungoid growths for the same reason, if they form, appear chiefly in the outlet channels, from which their removal is simpler.

A number of pages are occupied by tables of costs of various processes and combinations of processes. As frankly stated in the report, however, the validity of such comparisons must depend on local conditions, a given set of conditions lending itself better to one treatment than another. Thus, though percolating filters may be cheaper where there is plenty of fall, this advantage may be neutralised in another case by the necessity for pumping. Again, when the figure given for the cost of an acre of contact bed is £5,700, and in various places they are known to have been laid down at prices varying from £800 to £3,000 per acre, it is obvious that the interest of the comparison is somewhat academic. It may also be noted that a tank is provided in the hypothetical estimates for

the settlement of the effluent from the contact beds as well as from the percolating filters.

If the cost of this tank (£682 per million gallons) is to be justified, it seems hardly fair to assume that the coarse contact beds will require washing at intervals and estimate accordingly, while no sum is included for the eventual washing of the percolating filters.

The cost tables, it appears to me, should be taken, not as being generally applicable, but as models on the lines of which the cost of any proposed or actual scheme should be appraised. If they conduce to a more careful keeping of cost, figures and criticism of expenditure in works generally than is at present the case, they will serve a very useful purpose.

The main conclusions of the Commission with regard to *land treatment* were given in the valuable reports by Messrs. Houston, Kershaw & McGowan, published some years ago, and usefully summarised by Mr. Scoble. The assumption that, if really suitable land can be bought at £100 per acre, land treatment is cheaper than artificial treatment is doubtful where large volumes have to be dealt with, as the cost and difficulty of oversight must increase with the acreage, unless the questionable method of letting out to farmers be adopted. As a matter of fact, however, it is becoming increasingly difficult to get land of any sort at £100 per acre anywhere near towns, and, of course, the cost of the outfall sewer increases the further away the sewage is taken. With the yearly increasing consumption of water there are few cases in this country, I believe, where it will not be found simpler and less likely to cause nuisance to treat the liquid portion of the sewage by artificial filters, providing at the same time as much land as possible for trenching in the sludge, a method of sludge disposal which I am convinced is to be recommended wherever possible on sanitary, scientific and economic grounds.

It is when one comes to the recommendations as distinguished from the more debatable conclusions, so far considered, that it is possible to give whole-hearted support to the Commission. The Commission have taken a thoroughly sane and common-sense view, in my opinion, of their terms of reference which required them to have regard to the "economical and efficient" discharge of the duties of local authorities. The thorough purification of sewage, with our present knowledge, is mainly

a question of money, and it is of the greatest importance that sanitary reforms, equally if not more closely affecting the well-being of the community, especially, *e.g.*, the pollution of the atmosphere, the prevention of the formation of insanitary areas by better regulation of building sites and such like matters, should not be deferred in favour of large expenditure on the production of unnecessarily high-class effluents. There is certainly danger that in the rigid enforcement of so-called standards of purification in all cases such a result may be brought about. It is a question which may well receive the careful attention of medical officers of health. There are several directions in which the recommendations of the Royal Commission will lighten the burden of expenditure on sewage committees. In the first place, in regard to the treatment of storm-water, the Commission recommend that not more than three times the dry weather flow shall be *filtered*, the remainder to be passed through "stand-by" tanks capable of holding one-quarter of the daily flow. The storm overflow should be *after* these tanks, and thus no storm sewage arriving at the outfall works would be discharged without some settlement. The general result of this recommendation would mean, I believe, appreciable reduction in capital expenditure, greater simplicity in management of works, and probably, on the whole, no real detriment to the stream. It must always be remembered that during wet weather most rivers and streams are capable of bearing a certain amount of impurity without detriment, provided heavy solids, which may form permanent deposits, are removed. My own view also is that all large storm overflows should end as tank sewers in which heavy matter likely to form banks in the streams should be retained.

The tests which the Commission recommends for judging the degree of purification to which an effluent has attained are very simple, depending only on the amount of suspended solids present in, and the quantity of dissolved oxygen taken up by the sample under defined conditions. Admitting always the possibility of special cases this method of testing seems to me entirely reasonable. It is quite possible, to my knowledge, for effluents from strong sewages to infringe many of the provisional standards at present adopted and yet be strictly non-putrefactive and incapable of robbing a stream of oxygen, while an effluent from a weak sewage may come within

such limits as regards analytical figures and yet be highly putrefactive. The tests recommended by the Royal Commission judge fairly between effluents from different classes of sewage.

The most far-reaching recommendation of the Commission is that, in regard to many matters, ultimate control should be vested in an adequately equipped central administrative authority to which local River Boards should act as first tribunals.

The questions which the Commission anticipate that such an authority would deal with are worth quoting:—

(i.) Disputes between local authorities and manufacturers as to the terms and conditions on which trade effluents shall be admitted into sewers.

(ii.) The control of shell fish layings.

(iii.) The prevention of water supplies from pollution.

(iv.) The collection of information as to the water supplies available in various parts of the country.

(v.) The collection of information as to the need of water in various parts of the country.

(vi.) The settlement of standards for different reaches of water.

(vii.) Conferring powers on local authorities, in suitable cases, to provide separate system of sewers for surface water and to enforce the provision of separate drains.

(viii.) The settlement of questions as to the extra amount of sewage which a local authority should be required to treat during storms.

All of these questions, it will, I think, be agreed are best dealt with by a central authority independent of local influences. They also can best carry out many of the fundamental investigations which are still needed before sewage purification can be established on a thoroughly scientific basis. Much of the power available at local centres for such work must necessarily be absorbed in dealing with problems of somewhat special significance. The important part which has been played by the Massachusetts State Board of Health, and other more recently constituted Boards in the United States, and by the Government Experimental Station in Berlin, fully justify the formation of such a central laboratory for investigation.

One welcomes the suggestion that the results of such investigations, and also information collected by the authority and likely to be generally valuable should be published from time to time at fairly regular intervals.

The central authority would in no way

diminish the authority of the present Rivers Boards, any more than does the Local Government Board, with the added advantage that the central authority would have in certain directions advisory, as well as purely administrative powers.

It is, indeed, contemplated that where properly constituted rivers authorities do not at present exist, they shall be created. When one hears of factory sites in certain districts being advertised by the alluring statement that there will be "no trouble with Rivers Boards," it is evident that, in fairness to the public, as well as to other manufacturers less happily situated, such a state of things calls for prompt alteration.

It is believed to be the intention of the Government shortly to bring in a Bill embodying the recommendations of the Royal Commission. May we hope that it will receive the cordial support of rivers and sanitary authorities throughout the country, as a measure destined to effect much needed improvement in the condition of our water-courses, and generally to safeguard the great national asset of water-supply, while at the same time ensuring that other necessary sanitary reforms shall not be crippled by wasteful expenditure in these particular directions.

AN UNQUALIFIED MIDWIFE AND PUERPERAL FEVER.—At Battersea, on January 19th, Mr. John Troutbeck conducted an inquiry as to the death of Dorothy Barrett, aged 39, of Britannia Place, Plough Road, Battersea. The husband stated that on Monday week his wife was confined, being attended by a Mrs. Walsh, who they thought was a qualified midwife. May Walsh, of Livingstone Road, Battersea, said she had an invalid husband and three children dependants. She would not like to have to reckon up how many confinements she had attended. She had never been trained, and had acquired her knowledge from her mother, who was a trained nurse. Nobody warned her of Mrs. Barrett's serious condition, and she thought she was getting on nicely when she was removed to the infirmary. Dr. W. L. McCormac, of the Wandsworth Infirmary, stated that Mrs. Barrett was admitted on Saturday afternoon and died the same night, the cause of death being puerperal blood poisoning. The coroner said this was a typical case of the dreadful conditions under which poor women were often confined. The jury returned a verdict in accordance with the medical evidence, and added that the case should have been reported, and that unqualified midwives ought not to attend confinements. A London County Council inspector informed the Court that it would be possible to evade the law until March, 1910, when the new Act comes into force.

THE WORK OF A COUNTY BACTERIOLOGICAL LABORATORY.*

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THE total number of specimens dealt with during 1907, was 5,896, which exceeds the 1906 total by 1,254, and the average of the preceding three years by 2,603, the increase mainly occurring in the Diphtheria and Miscellaneous sections.

DIPHTHERIA EXAMINATIONS.

There was an increase of 681 in the number of swabs examined for the diphtheria bacillus, 3,940 being dealt with as compared with 3,259 during 1906. School investigations conducted from this department account for 530, the corresponding figures for the preceding year being 325.

An explanation is usually given of the grouping of diphtheria specimens into two classes:—(1) primary, comprising all swabs received for the first time for purposes of diagnosis, and (2) secondary or convalescent swabs, sent at later dates from the same cases, usually with the object of ascertaining whether the patient is yet free from infection. The great bulk of the secondary swabs is furnished by certain of the isolation hospitals, the patient being detained in isolation as long as the infective organism is reported as still being present.

In addition to cases suspected of actually suffering from diphtheria, swabs are also sent from diphtheria "contacts," and from cases of scarlet fever. There is an increasing tendency on the part of medical men to make use of the laboratory for the examination of contact, and a more general adoption of this practice would be welcomed. As regards scarlet fever, a fair number of swabs is received from cases newly admitted to some of the isolation hospitals. These are sent as a routine precautionary proceeding against the introduction of diphtheria into the hospital by cases of mixed infection, or by cases of diphtheria which may simulate scarlet fever. Similar investigations would gladly be undertaken for other isolation hospitals within the Riding.

RESULT OF BACTERIOLOGICAL EXAMINATION OF 3,940 SPECIMENS FOR THE DIPHTHERIA BACILLUS.

Final Diagnosis ascertained after the lapse of three months.	Diphtheria Bacillus.	
	Found.	Not found.
Diphtheria 600	508	92
Not Diphtheria 650	27	623
No Return 1186	276	910
Convalescent Cases 1504	621	883
Total 3940	1432	2508

* Annual Report, 1907.

It should be explained that in this table "Final Diagnosis" represents the ultimate opinion of the medical attendant as to the nature of his case. This information is supplied in response to periodic requests from the laboratory in connection with primary swabs only.

The table presents some features which call for comment and which may be most conveniently considered in the order of grouping therein adopted.

Final Diagnosis Diphtheria.—Positive results are seen to have been obtained bacteriologically from 508, or 84.6 per cent. of the 600 swabs from cases eventually diagnosed as diphtheria. More than 15 per cent. of the 508 cases were reported as having characteristic complications, and forty-one proved fatal, a case mortality of 7.9 per cent.

Negative results were obtained from the remaining ninety-two swabs of this class, equivalent to 15.4 per cent. Of these, eighteen proved positive on repetition, while a further negative result was obtained from twenty-one other repeated swabs, although sequelæ characteristic of diphtheria, were observed in three of the cases from which the latter specimens were derived.

Swabs were reported as sterile in five instances, no bacterial growth of any kind being obtained on cultivation, and requests for repetition were not complied with. A sterile result usually points to a faulty method of collection of the specimen and should not be accepted as final and indicative of safety.

The diagnosis of diphtheria was confirmed by sequelæ in seven of the remaining forty-eight negative swabs.

Final Diagnosis not Diphtheria.—Of the twenty-seven swabs which gave positive results in this group thirteen were from "contacts," not actual sufferers, who would therefore not be classed as clinical cases of diphtheria. In the absence of similar information with regard to the remaining fourteen, the presence of the diphtheria bacillus appears not to have carried weight as a determining factor in diagnosis.

No Return.—After deducting from this group 530 school swabs there remain 656 primary swabs with regard to which no information was supplied in answer to the request for a statement of the final diagnosis. This is unfortunate, as the value of the deductions to be drawn is considerably lessened by the reduction of the number of specimens available for statistical examination.

Convalescent Cases.—In addition to repeated swabs, as before explained, this group includes a number sent for the first time, not for diagnostic purposes, but at a later stage only for an opinion as to freedom from infection.

There were forty-four primary and forty-three secondary swabs reported as sterile, a total of eighty-seven. It should be emphasised that a sterile result ought not to be accepted as indicating the absence of the diphtheria organism from a throat. Sterility is usually due to the action of antiseptics applied as a local remedy, but may result from failure to bring the swab into proper contact with the affected portion of the fauces. In all cases a further specimen should be sent.

For the detection of the diphtheria bacillus, the cultural method is chiefly relied upon. This has the drawback of requiring a period of at least twelve hours for incubation, thus necessitating a delay of about a day in the furnishing of reports. This is a matter of some importance in the early stages of diphtheria, from the standpoint of both isolation and treatment, and in order to minimise the disadvantage as far as possible an "immediate" examination of each primary swab is made early on the day of its arrival at the laboratory. After the inoculation of media for cultural examination, smear preparations from the swab are made and examined microscopically, a special stain being employed (Gordon Pugh's formula). If organisms stained in the manner characteristic of diphtheria are observed, a preliminary report is furnished that the diphtheria bacillus is probably present, this being subject to confirmation on the following day by examination of the culture. "Preliminary" reports are stated in terms of probability only, because it is possible for other organisms to simulate the bacillus of diphtheria. Although the margin of error from this cause is small, only six out of 300 reports being erroneous during 1907 (see table below), it is considered undesirable to vouch for absolute identity on preliminary examination.

PRELIMINARY EXAMINATION OF 1,754 SWABS.

Culture gave:—	Immediate Examination gave:—	
	Positive Results.	Negative Results.
Positive Results 689	294	395
Negative Results 1065	6	1059
Total 1754	300	1454

For various reasons, one being that only a small number of diphtheria organisms may actually be present on the swab, the diphtheria bacillus is only detected on preliminary examination in a certain proportion of the specimens from which positive results are subsequently obtained by cultural methods. The table shows that it was possible to furnish a positive immediate report upon 42 per cent. (294 out of 689) of the specimens from which the diphtheria bacillus was finally isolated by cultural methods.

In the last Annual Report an analysis was made of the results furnished by swabs received from 185 cases of diphtheria, the object being to ascertain the average persistence of the diphtheria organism in the throat during an attack of the disease. Only such cases were included as fulfilled the necessary conditions, viz.: A definite statement was made as to the date of onset of the illness, the diagnosis was confirmed bacteriologically, and successive swabs were furnished until negative results were obtained. A similar inquiry into 216 cases from which swabs were received during 1907 shows that the diphtheria bacillus was, on the average, last found to be present on the twenty-eighth day from the commencement of the attack. Taking the average persistence in days

of the specific organism in the throat as being the mean between the last positive and the first negative results (at which date the bacillus may be presumed to disappear), the duration of infection in these cases was 33.4 days, or practically five weeks.

PERSISTENCE OF DIPHTHERIA BACILLUS IN 216 CASES

(based on the last possible results.)

Under 1 week	...	12	per cent.
1 week and under 2	...	9.7	"
2 weeks	3	17.2	"
3 "	4	20.8	"
4 "	5	17.6	"
5 "	6	7.8	"
6 "	7	4.6	"
7 " and upwards	...	10.3	"

This table shows that the average period of possible spread of infection from the throat in these cases varied from less than one week to seven weeks and upwards, and demonstrates the danger attendant upon adopting an arbitrary period of, say three or four weeks, for the isolation of diphtheria cases.

The services of the department were called for in three localities in connection with outbreaks of diphtheria having special incidence on children attending certain schools. These schools were visited with the local medical officer of health, and swabs were taken either from all the children present or from those whose throats presented abnormal appearances, according to local circumstances. Altogether 530 swabs were taken during twelve inspections of nine school departments. As is usual during an outbreak of diphtheria among school children, the diphtheria bacillus was found in throats which presented no clinical evidence of disease, and the "carrier" was thus repeatedly demonstrated. Examples may be quoted of two schools of 105 and 93 children respectively, all of whom were swabbed. Positive results were obtained from eight throats in both instances, though none of these showed any evidence of disease beyond a little congestion of the fauces in a few instances. In dealing with diphtheria, which differs markedly from such infectious diseases as measles and whooping cough in that any danger signal is frequently absent, the importance of bacteriological methods of investigation is thus amply demonstrated.

Serum Diagnosis of Enteric Fever.—During the year, 300 blood specimens were received in connection with cases of suspected enteric fever. This is the smallest number examined in any year since 1904, the decrease being accounted for by the diminished incidence of the disease in the administrative county, the number of cases notified during 1907, viz., 597, amounting to little more than one-half of the average for the preceding three years. The ratio of specimens submitted for diagnosis to cases of enteric notified is, however, higher than in any previous year since the establishment of the laboratory.

The following Table gives the final opinion of the medical attendant compared with the bacteriological result:—

Final Diagnosis ascertained after the lapse of three months.		Results of Serum Reaction.		
		Positive.	Negative.	Doubtful.
Enteric	92	73	15	4
Not Enteric	109	2	105	2
No Return	99	31	67	1
Totals	300	106	187	7

Excluding those cases concerning which no final opinion was obtained, Widal's test gave a decided positive reaction in seventy-five instances, in seventy-three of which the bacteriological diagnosis was confirmed by the subsequent progress of the cases—the exceptions being regarded as influenza and ulcerative colitis respectively. Of 120 cases in which no reaction could be obtained, in 105 the result was confirmed by the final diagnosis of the medical attendants, while the remaining fifteen were considered to be enteric. The specimens classed as doubtful are those which gave too feeble a reaction for a definite opinion to be expressed.

From the above Table and those of preceding years, it will be seen that the bacteriological and ultimate clinical diagnoses by no means invariably coincide, and it may be of interest, as giving some indication of the value of Widal's test, to note the proportion of cases in which they are found to disagree. For this purpose the number of specimens dealt with in a single year is too small to afford a reliable guide, and an analysis has therefore been made of the total number (1,224)—concerning which the necessary information was available—dealt with in the laboratory since its establishment in 1901. This shows that 1.2 per cent. of the positive results and 17.9 per cent. of the negative results were at variance with the final opinion of the medical attendant. The former figure may be regarded as a fair representation of the liability to error in positive examples, a considerable proportion of which error is doubtless due to cases where the reaction is merely a relic of a previous unrecognised attack of enteric; but a great reduction would be effected in the proportion of discrepant negative results if more care were exercised in the collection of specimens. Evidence of overheating of the blood during sealing of the collection pipettes with consequent destruction of agglutinative properties upon which Widal's reaction depends, has been frequently met with; and in other instances the blood has been submitted for examination within the first few days of illness, at which period agglutinins have not developed in a considerable proportion of cases. Request for repetition has not always been complied with.

Even when errors in collection are eliminated, it has been estimated that in from 5 to 10 per cent. of cases of clinical enteric fever the blood does not

give Widal's reaction when tested with the *B. typhosus* at any stage of illness.

It is probable that a considerable proportion of these are cases not of true enteric, but of paratyphoid infection, a disease clinically identical with enteric, but produced by bacilli distinct from, though closely allied to *B. Typhosus*. In this disease the diluted blood serum gives no re-action when tested with the latter organism, but re-acts readily with the particular variety of *B. Paratyphosus* responsible for the illness, and by this means identification of the disease may be established.

It has not been found practicable in this laboratory to test specimens with *B. Paratyphosus* as a routine procedure, the employment of several varieties of the organism, involving considerable expenditure of time, being necessary, but the test has been applied in a few special cases, and it is hoped that in future its more extensive use will be possible.

From consideration of the foregoing figures it is evident that while great reliance may be placed upon positive reactions, negative results are somewhat less trustworthy, and the recognition of this fact is essential for the correct interpretation of laboratory reports.

An outbreak of enteric occurring in the West Riding in 1907, and investigated by this Department, well exemplifies the difficulty in diagnosing, and the danger of overlooking an atypical case of this disease. The majority of cases constituting the epidemic were traceable to direct or indirect infection by a person who had suffered from a febrile illness which, beyond the temperature, presented none of the usual symptoms of enteric, and was not recognised as such by the medical attendants. A specimen of this patient's blood, procured during late convalescence, gave so marked a reaction in high dilution as to place the nature of the illness beyond doubt, and it is reasonable to assume that the earlier application of Widal's test, by leading to the adoption of precautions against conveyance of infection, would have prevented the occurrence of secondary cases.

The laboratory records contain numerous additional examples of the value of this test in throwing light on obscure illnesses.

It may be of interest to note the relative frequency of occurrence of the characteristic symptoms, apart from fever, upon which the differential diagnosis of enteric is usually based, and a consideration of the sixty-nine cases occurring during 1907, in which a positive Widal reaction was confirmed by the final diagnosis, and full clinical details were supplied shows that:—

In thirty-two cases "rose spots" were absent, and no enlargement of the spleen could be made out; in seventeen of these, more or less diarrhoea occurred.

In eleven no spots were seen, but the spleen was enlarged, and in seven cases diarrhoea was present.

In twenty-one a typical rash occurred, but the spleen was not enlarged; diarrhoea was present in fourteen.

In five both spots and enlarged spleen were found, and in four of these diarrhoea also occurred.

Deductions drawn from so small a number of cases do not of course possess any statistical value, but the particulars given above serve to illustrate the clinical variability of the disease.

EXAMINATION OF SPUTUM FOR TUBERCLE BACILLUS.

There is practically no increase in the number of sputa examined for the tubercle bacillus, the total being 583 as compared with 575 during 1906.

In the following Table the bacteriological results and the final medical opinion are combined :—

Final Diagnosis ascertained after the lapse of three months.		Tubercle bacillus found.	Tubercle bacillus not found.
Tuberculosis	195 ...	154	41
Not Tuberculosis	177 ...	—	177
No Return	211 ...	52	159
Total	583 ...	206	377

The tubercle bacillus was found in 154, or 79 per cent., of 195 sputa from cases finally regarded as tubercular in their nature. Physical signs were stated to be either absent or indefinite in thirty-two cases which gave positive bacteriological results, showing the importance of this method of diagnosis at an early period where any suspicion of tubercular infection arises.

The forty-one cases finally regarded clinically as phthisis, although the tubercle bacillus was not detected in the sputum, demonstrate the importance of repeating specimens upon which negative reports have been furnished, though the possibility of error in clinical diagnosis in some of these cases should be borne in mind.

Information was given concerning the family history in 150 of the cases found bacteriologically to be tubercular, and is classified below :—

FAMILY HISTORY OF TUBERCULOSIS.

	Male	Female	Total
Stated to be known ...	32	21	53
Stated not to be known ...	61	36	97
Totals ...	93	57	150

In one-third only of the total cases, therefore, was there known to be a family history of tuberculosis, and in half of these again (twenty-six of fifty-three) the relationship of the patient to other affected members of the family was such as to suggest direct infection rather than inheritance of a constitutional tendency to the disease. The fact that environment is of greater importance than heredity as a predisposing factor appears to be demonstrated by these figures.

MISCELLANEOUS EXAMINATIONS.

In addition to the specimens which have already been considered, 1,073 examinations were made which are classified as "miscellaneous," and are roughly grouped as follows :—

Ringworm	972
Anthrax	24
Cerebro-Spinal Meningitis	9
Urine for Typhoid Bacillus	10
Urine for Tubercle Bacillus	15
Other specimens for Tubercle Bacillus	19
General Bacteriological	12
General Pathological	12

1073

Ringworm.—The microscopic diagnosis of ringworm was commenced in this laboratory during 1906 in connection with specimens collected by members of the staff during school inspections. During 1907, in a circular dealing with the scope of the work undertaken in the County Laboratory, the attention of the local medical officers was drawn to this branch of investigation, and through them the private practitioners in the Riding were invited to send specimens for examination, the object in view being the diminished prevalence of ringworm among school children. Printed instructions for the collection of specimens of hair suspected of being infected with the parasite and envelopes for their transmission are now supplied on application. So far the request for such examinations has been limited, for out of a total of 972 specimens, 860 of which gave positive and 112 negative results, 950 were collected by members of the staff, the remaining twenty-two being furnished by private practitioners. Practically all the specimens were from school children, but the 950 must not be taken as indicating individual cases existing in the schools, for specimens were frequently taken from the same children on re-inspection to judge as to their fitness for re-admission to school.

Anthrax.—Of the twenty-four anthrax investigations, the material was in twelve instances from man and in six from animals. Six specimens of cotton cake were also examined, upon which cattle reported as having died of anthrax had been fed, but the anthrax bacillus was not found in any of the specimens from man, all but one were from suspected malignant pustules. Excluding this specimen, a sputum from a textile operative, which gave a negative result, there were eleven specimens from ten suspected cases, the anthrax bacillus being found in material from two out of five textile operatives, in two further cases after contact with anthrax carcasses, and in one other case where the occupation was not stated; a total of six positive specimens from five cases.

Cerebro-Spinal Meningitis.—In consequence of the prevalence of cerebro-spinal meningitis in Glasgow and Belfast, and reports of sporadic cases throughout the country, the fact that bacteriological examinations would be undertaken in connection with this disease was notified to the local medical officers of health in the circular before referred to. Material from nine cases was received, including two swabs from the naso-

pharynx, and five specimens of cerebro-spinal fluid, one of the latter being collected by a member of the staff in consultation. A brain was also sent, in which a large hemorrhage was found, and also the brain, spinal cord, and cerebro-spinal fluid from a child by order of the coroner. In no specimen was the organism of cerebro-spinal fever found, and there seems little doubt that in the great majority of isolated cases reported from various parts of the country the meningitis was not of the infective type. This is not to be wondered at, as the medical practitioner in this country has, fortunately, practically no opportunity of observing this disease, apart from rare outbreaks in large centres of population.

Urine for Typhoid Bacillus.—Ten specimens of urine were examined for the typhoid bacillus, with a negative result in every instance, although seven of the cases from which they were derived were considered to be cases of enteric fever. It may be repeated here that the typhoid organism is not found in the urine in more than 30 per cent. of enteric fever cases, and seldom during the first two weeks. On the other hand, the widal reaction is obtainable from the blood in about 95 per cent. of such cases—in the great majority within a week or ten days—so that the diagnostic value of urine examination will be seen to be slight compared with the blood reaction. The chief object, therefore, is to ascertain whether the typhoid bacillus is still being excreted in the urine, and the patient thus liable to be a source of infection. In enteric fever, as in diphtheria, the "carrier" case has come into prominence, and it has recently been stated that three or four per cent. of all cases of enteric fever continue to distribute infection after apparently complete recovery from attack. It seems reasonable to anticipate that bacteriological examination of the urine during convalescence from enteric fever will become a routine preventive procedure, and its desirability in the case of persons who are occupied in the production and distribution of milk and other food supplies hardly requires special emphasis.

Urine for Tubercle Bacillus.—Fifteen specimens of urine were examined for the tubercle bacillus, four of which gave a positive result. Two of the cases from which these were derived were finally diagnosed as tubercular, no opinion being obtained with regard to the other two. In a further case finally diagnosed as tubercular the bacillus was not found, while in six instances both clinical and bacteriological results were negative. It may be pointed out here that whereas a final report may be given on a sputum on the day of its receipt, so early a report in the case of urine is usually preliminary and provisional, the conclusive investigation occupying several weeks.

Other Tubercular Specimens.—Nineteen other specimens were examined for the tubercle bacillus, including nine of pleuritic fluid and pus from the pleural cavity, all of which gave negative results, as did also two of urethral secretion and one of pus from another source. The tubercle bacillus was found in the discharge from an elbow joint.

The remaining seven specimens were of food materials, and are detailed as follows :—

Milk.—Two specimens, one from a cow which supplied two tubercular children and one from a private can. In neither was the tubercle bacillus found.

Meat.—These were in each instance examined at the request of a local medical officer of health—

Case 1.—Mediastinal glands of slaughtered bullock. Bacillus found.

Case 2.—Liver and glands after purchase. Bacillus not found.

Case 3.—Glands, lung, and liver of pig bacillus found in all.

Case 4.—Caseous glands from pig. Bacillus found.

Case 5.—Lung of cow. Bacillus found.

General Bacteriological Examinations.—Of twelve examinations grouped under this heading, three were of urine specimens, four were to demonstrate the value of the aseptic precautions taken before operation in a general hospital, and one was to test the efficacy of an antiseptic preparation. Two milk specimens were also examined, one of which was regarded as a possible cause of diarrhoea, while the other was received from an isolation hospital on account of its alleged dirty condition. In neither case did the bacteriological results confirm the suspicion attached to the samples.

The remaining two specimens were water samples. One was from a shallow well, the water supply of five houses in which two cases of enteric had occurred—one of them fatal. Manurial contamination was regarded as possible, but bacteriological investigation afforded no evidence of this. The other sample was from a well situated in the fold yard of a farm where a recent case of enteric fever had occurred, and the bacteriological examination revealed undoubted evidence of the presence of excretal pollution of the water.

General Microscopical and Pathological Examinations.—The majority of these twelve specimens call for no special comment. Two were water samples for microscopical examination, and three were meat samples. In one of the latter, a cow's tongue, the ray fungus (actinomyces) was found.

NOTE.—The bacteriological work referred to in this article was conducted by Dr. F. Robinson, now County Medical Officer of Health, Cambridgeshire, and Dr. W. Sisam, now Medical Officer of Health, Handsworth.

PROCEEDINGS AGAINST A PARISH COUNCIL.—The Camblesforth Parish Council, near Selby, who own a cottage at that place, were summoned on December 28th before the Selby magistrates, for having a house unfit for human habitation. Dr. Stedman, Medical Officer of Health to the Selby Rural District Council, prosecuted, and Mr. George Winters, Clerk to the Parish Council, asked for an adjournment, in order that he might bring the matter before that body, with a view to the necessary repairs being carried out. The Bench agreed to a month's adjournment.

THE NEW MEMORANDUM OF THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD ON ANNUAL REPORTS OF MEDICAL OFFICERS OF HEALTH, AND THE BOARD'S CIRCULAR LETTER ACCOMPANYING IT.

SEVERAL new points are embodied in these documents, just issued by the Board.

In the circular letter of the Board, an intimation is given that if any district wishes to extend the provisions of the Infectious Diseases (Notification) Act, 1889, to anthrax, glanders, and hydrophobia in man, the Board will be prepared to entertain the application favourably.

In the memorandum of the medical officer of the Board, the time within which annual reports of medical officers of health should reach the Board is somewhat extended; and it is pointed out that no delay need occur through waiting for the returns of the Registrar-General, as the chief rates required are embodied in the return of the Registrar-General for the last quarter of the current year, which is published about six weeks after the end of the year.

A number of additional items have been added as forming matters on which comment is asked for in the annual report. Thus it is requested that information may be given of action taken or needed under either Parts I, II, and III of the Housing of the Working Classes Act. An important addition is made in relation to water supply; it being stated that "in the case of water liable to have plumbo-solvent action, any facts, either clinical or chemical, whether negative or positive, as to contamination of the water by lead should be stated, and whether administrative action has been taken during the year in respect of such contamination."

Further additional items are "tuberculous milk" and "number of carcasses and parts of carcasses condemned for tuberculosis."

The following new paragraph appears as matter concerning which information is asked:—

"Methods of control of tuberculosis; whether any system of notification of cases of pulmonary tuberculosis, compulsory or voluntary, is in operation; number of cases notified; what action is taken in respect of known cases and of deaths; amount of hospital accommodation for cases of pulmonary tuberculosis in infirmaries and elsewhere, for advanced and for earlier cases of the disease."

Information is also asked for as to the administration of the Midwives Act and of the Notification of Births' Act.

MIDWIVES ACT COMMITTEE.—The second meeting of the committee was held in the Board Room at the Privy Council Office on Wednesday, 20th January. Mr. Almeric FitzRoy, C.V.O., the clerk of the council, was in the chair, and all the members were present. Mr. G. W. Duncan, the secretary of the Central Midwives Board, attended and gave evidence on behalf of that Board.

MUNICIPAL ELECTROLYTIC DISINFECTING FLUID.

DR. F. ALEXANDER, the Medical Officer of Health of Poplar, has recently issued a special report on the electrolytic disinfecting fluid manufactured by the Poplar Borough Council. Replying to criticisms that have been made, Dr. Alexander brings forward certain evidence as to the germicidal action and stability of the fluid, and he concludes his report with the following details of the expenditure incurred by the Council in making its own disinfectant:—

"The cost of materials in manufacturing the 24,178 gallons* of the electrolytic fluid for the current year has been as follows:—

	£	s.	d.
Electricity, 3,892 units at 1½d. per unit	24	6	6
Chloride of Magnesium	23	3	3
Salt, 6 tons ...	9	18	0
Caustic Soda ...	5	17	4
Water ...	1	10	0
Total cost of materials to produce 24,178 gallons ...	£52	1	1*

The cost of labour remains about the same (even with another depôt opened) as it was during the year 1907. The wages are—one man manufacturing the fluid, paid 35s. per week, and three men distributing at various arranged hours at the five depôts (32s., 30s., and 30s. respectively).

The fluid is still distributed to the inhabitants of the Borough from five depôts. Applicants bring their own bottles and vessels, and this method of distribution effects a saving to the council, as the cost of the bottles for the ten months of this year (and there are a large number of bottles in stock at present) will show. Bottles have cost £31 2s. 11d., labels £3, and corks £4 14s. 6d., the cost of bottles, corks, labels and bags for the years 1903, 1904 and 1905 being £142 3s. 11d., £172 18s. 4d. and £168 7s. 7d. respectively.

The cost of repairs, renewals and improvement for the working of the whole concern has been under £40 during the year 1908.

In these days of cheap electricity, every municipal authority throughout the United Kingdom having an electric installation, should have a plan for making this electrolytic disinfecting fluid and supplying the inhabitants in their own bottles and vessels free on application, as experience and opinions of experts prompt me to the conclusion that at the present time no better or surer disinfectant is upon the market."

* Since the plant has been installed (a period of nearly three years) 55,152 gallons of Electrolytic Fluid have been manufactured, and the cost for electricity and materials has been under £120, and so far as the electrodes are concerned, about one dozen zinc electrodes with tin-encased nuts and bolts for fixing same have been replaced, at a cost of under 40s.

THE ADMINISTRATION OF THE EMPLOYMENT OF CHILDREN ACT IN BRADFORD.*

By W. ARNOLD EVANS, M.D., B.Sc.,
Medical Officer of Health, Bradford.

SPECIAL attention has been paid to the employment of children in the city, and a large number of visits and investigations have been made at all hours of the day from before 6.0 in the morning until 11.0 in the evening, with a view to the enforcement of the provisions of the Employment of Children Act, 1903, and the bye-laws made by the City Council for the regulation of the employment of children before and after school hours, and as half-timers.

In the course of the year 378 children have been found employed in contravention of the bye-laws, and forty-four children in contravention of the general provisions of the Act. The number of separate offences committed in connection with these 422 children was 724, which is accounted for by the fact that in a great many cases more than one offence was committed in respect of each child.

In twenty-four cases, where the offence was repeated after warnings had been given, the employers were prosecuted. All the remaining employers were served with warning notices and supplied with printed copies of the bye-laws.

The following is a summary of the offences committed:—

Children employed after 9 p.m. on Saturdays	11
Children employed after 8 p.m. on weekdays	105
Children employed before and after school hours for over twenty hours per week	37
Children employed as half-timers for over thirty hours per week	75
Children employed the whole of the day on Saturday	215
Children employed under eleven years of age	13
Children employed on Sundays	9
Children employed both mornings and evenings	103
Children employed during meal hours	110
Children employed in public entertainments without licence	24
Children employed before six in the morning	2
Children employed after having been employed half-time in factories	5
Other offences	15
Total	724

* Annual Report, 1907.

The number of children recorded on the Register of Shops as being employed at the end of the year was as follows:—

Trade.	Children Attending School full time.	Children Attending School half-time.	Totals.
Hairdressers	194	11	205
Butchers	100	26	126
Newsagents	162	38	200
Grocers	43	32	75
Fruit and Game Dealers	36	26	62
Chemists	10	10	20
Drapers	9	9	18
Milk Dealers	6	4	10
Boot and Shoe Dealers	10	6	16
Confectioners	11	8	19
Fancy Dealers	5	4	9
Ironmongers	4	4	8
Tailors	2	6	8
Other Trades	5	19	24
Public Entertainments	118	1	119
Totals	715	204	919

There is also a large number of boys in addition to these who are licensed to sell newspapers and who are not employed by newsagents. The number licensed by the Watch Committee was 326.

Ninety children have been licensed by the magistrates during the year to take part in public entertainments at the various theatres and places of amusement. Visits were made by the inspector in each case, and a large number of additional visits were made to these places at various times.

Twenty-four children were found, during the twelve months, to be taking part in public entertainments after eight in the evening, or, under 11 years of age, without the magistrates' licence required by the Prevention of Cruelty to Children Act. The managers and persons responsible for the entertainments were warned in each case. The performance of one of the licensed children was of a dangerous nature, and notice was sent to the Chief of Police of the next town the troupe was visiting so that conditions might be made in the licence to guard against danger to the child.

At one of the theatres a child was found employed in the pantomime as a ballet girl after having been also employed as a half-timer in a factory. The work of this child therefore continued from six o'clock in the morning until eleven o'clock in the evening during the weeks when she was on the morning turn at the factory. The father having given a false certificate to the proprietors of the theatre that the child was over 14 years of age, proceedings were taken against him and the magistrates inflicted a penalty of £1 6s., including costs.

A REGIMENTAL EPIDEMIC OF CEREBRO-SPINAL MENINGITIS.

IN a recent number of the *Zeitschrift für Hygiene und Infektionskrankheiten*, (Vol. 61, Part 3), Dr. Bochalli, a physician to the German Sanatorium of Davos, gives his experience of the spreading of Epidemic Cerebro-spinal Meningitis.

He begins by mentioning that the inquiries of v. Lingelsheim, Ostermann, Bruns and others have proved beyond a doubt that this disease is principally spread by healthy "cocci-carriers."

In Beuthen, in 1906, he had an opportunity of investigating this matter in Professor v. Lingelsheim's Hygienic Institute. On the 20th of March, 1906, a musketeer of an infantry regiment, which was stationed in this town, was brought insensible into hospital, the case being diagnosed as cerebro-spinal meningitis, and confirmed by the discovery of meningococci in the nasal mucus on March 24th. On March 28th, sixteen of his dormitory comrades were examined and ten found to have meningococci in the naso-pharynx; of ten men belonging to a neighbouring room examined, three had cocci, as also three out of several examined in other rooms of the same company.

In all there were sixteen carriers among forty-one examined. Four of these developed some suspicious symptoms, headache, etc., but as the main symptoms were only those of acute bronchitis and pharyngitis, they were soon sent back and isolated with the other carrier. Prof. v. L. therefore decided to have all the battalions of Beuthen examined for cocci. This was done by inserting a bent cotton swab up behind the avula and taking the mucus from the back of the upper pharyngeal wall behind the soft palate. A full account of the media used is given, and of the agglutination tests employed.

Out of a total of 485 men examined, forty-two were meningo "cocci-carriers" (=8.6%). This cannot be considered the normal percentage of carriers in the environs of the patient, and the author got very interesting results by grouping the men examined, viz.:—Among sixteen dormitory comrades—i.e., those in his immediate surroundings—there were ten carriers (=62.5%)—(Ostermann found the percentage in families where cases had occurred 70.8, Bruns about 50%). The next group, representing the second wider circle of contacts, consisted of 114 men, with thirteen (=11.4%) cocci-carriers; and a third group, containing the remotest contacts, consisting of 355 men, with nineteen (=5.4%) cocci-carriers. These results on the whole agree with those of other inquiries, but the author remarks that differences will always exist dependent chiefly on the extensiveness, frequency, and period of examination in relation to the patient and the epidemic. For instance, Bruns states that carriers are more frequent at the beginning and height than at the end of an epidemic. In epidemic time the "cocci-carriers" in the wider circle of contacts are estimated by Bruns and Flugge to be ten and twenty times the number of actual cases. As control, the author examined forty men in a

battalion in Gleiwitz, where there had been no case of meningitis, and found them all free of meningococci. The cocci usually disappear quickly from the naso-pharyngeal mucus, but may remain four weeks. In a single case of Bruns they remained four-and-a-half months. All carriers were isolated, and antiseptic medication of the bone was found useless. That so few carriers fell ill is no doubt due to the slight disposition of adults to infection.

Of forty-three "carriers" (i.e., forty-two men and one officer) twenty-four (55.8%) showed alteration of the pharyngeal mucus membrane, sometimes slight, sometimes marked; nineteen had normal throats—but possibly at the time of examination they may have recovered from pharyngitis. Only four men required hospital treatment for throats.

Slight attacks of pharyngitis are very common. Out of 485 men only 281 (=57.9%) had normal throats, and of these eighteen (=6.4%) had meningococci; of the 204 with mild pharyngitis, twenty-four (=11.7%) had meningococci. Meningococci "carriers" are not to be expected to occur in every case of cerebro-spinal meningitis, especially where the patient becomes ill after a long latent period. The author gives an interesting example of this. A nurse left Silicia, where meningitis had been epidemic, to go to Davos on account of slight pulmonary tuberculosis, and some fourteen days after leaving arrived at the latter. Seventeen days later (i.e., after a latency of at least a month) she fell ill with epidemic meningitis, was treated with Kolle-Wasserman serum, and recovered. The deductions which he draws from this case are: (1) That predisposition to the illness was probably carried in some way by her sojourn indoors; (2) That the cocci are most numerous and virulent during the first week of their settling in the throat, and that, therefore, the absence of any "carriers" among contacts is largely explained by her having passed that period before she arrived at Davos. Strict isolation on discovery of the nature of the illness was at once carried out. It is probable also that the sun's rays, against which the cocci are little resistant, and which are very powerful in the region, also contributed to the non-occurrence of "carriers" in the institution.

APPOINTMENTS.

EDWARD G. GIBBS-SMITH, L.R.C.P.I., L.S.A. Lond., D.P.H., has been appointed Medical Officer of Health for Teddington.

JOHN ELLIOTT ROBINSON, M.B., B.S. Lond., L.R.C.P. Lond., M.R.C.S., has been appointed Principal Medical Inspector of Schools for the County of Dorset.

A. E. R. WEAVER, M.D., Ch.B. Birm., D.P.H. Birm., has been appointed Assistant Medical Inspector of Schools for the County of Dorset.

H. F. KINGSTON, M.B., B.Ch., Dub., has been appointed Medical Officer of Health to the Alsager Urban District.

J. LAWSON RUSSELL, M.B., C.M. Edin., has been appointed School Medical Officer to the Todmorden Town Council.

E. L. ROWE, L.R.C.P., L.R.C.S. Edin., has been appointed Medical Officer of Health to the Swaffham Rural District.

W. L. HAWKSLEY, M.B., Ch.B., D.P.H., has been appointed School Medical Officer to the City of Liverpool Education Committee.

REVIEWS.

DISEASES OF OCCUPATION. By Sir Thomas Oliver, M.D., F.R.C.P. London: Methuen and Co., 1908. Price 10s. 6d. net.

In this book Sir Thomas Oliver has endeavoured to "place before the general and professional reader important facts dealing with the effects of industries upon health," and he hopes that the book "will prove useful to Members of Parliament, to all persons interested in schemes of social betterment, to medical officers of health, and to members of the medical profession generally." With this object in view, the author has evidently sought to present his material with smallest possible use of technicalities, and he has been remarkably successful. The book can be appreciated by a reader who is without technical knowledge of medicine, or of the various industrial processes dealt with; but it is none the less a valuable text-book for medical practitioners, and especially for medical officers of health.

A noteworthy feature of the book is the wealth of first-hand information it contains. The author has not been content to search for his facts through the maze of German monographs. Although well versed in the literature of the subject, Sir Thomas writes not only of what he has read, but largely of what he has seen in his long and extensive clinical practice in a great industrial centre, in his laboratory, and in the numerous "works" he has visited, both in this country and abroad. To this element of personal experience the book owes much of its absorbing interest, for it is one of those books that the reader finds difficult to close until the last page is reached. Of special interest are the sections on caisson disease, lead poisoning, phosphorus poisoning, "Rand miners' " phthisis, and ankylostomiasis. Sir Thomas has discovered the inventor of the lucifer match, John Walker, of Stockton-on-Tees, who died in 1859. Walker's first matches were made of cardboard, and were sold at the rate of fifty matches for a shilling. From Walker's books, which are still in existence, it appears that he was making matches for sale in 1827. In the first chapter there is an interesting discussion of malingering, with special reference to the Workmen's Compensation Act. Malingering, it appears, is not illegal in this country as it is in France, Prussia and Austria. In France, it has become of sufficient importance to have called forth a special literature.

The book has been brought well up to date, but the statistics relating to phthisis in laundresses on p. 390, which are taken from the Annual Report of the Chief Inspector of Factories for 1900, might with advantage have given place to the more extensive and detailed figures in the Annual Report for 1905. It is a pity there is no bibliography. The author would confer a great benefit upon the students of industrial hygiene by providing one in the next edition. The chief effect of the book upon the present reviewer is to create a desire for more. There is a wonderful amount of information contained in the 412 pages of this volume, but much perforce has had to be omitted, and we

should like Sir Thomas Oliver to set forth his unique knowledge of this important subject, the importance of which increases every year, in an exhaustive treatise.

OUR TEETH, HOW BUILT UP, HOW DESTROYED, HOW PRESERVED. By R. Denison Pedley, F.R.C.S. Ed., L.D.S. Eng., and Frank Harrison, M.R.C.S. Eng., L.D.S. Ed. Blackie & Son. Demy 8vo. 5/- net.

This book is specially welcome at the present moment, when medical inspection has at length directed public attention to the urgent importance of dental hygiene. The authors, in some eight short chapters, describe clearly, but succinctly, the anatomy and physiology of the teeth, together with the etiology and prevention of dental caries. Both text and illustrations are excellent examples of the way in which a lay audience should be addressed. Technicalities have been avoided without the sacrifice of scientific accuracy, nor is there any evidence of that straining after effect, which mars so many popular expositions of medical subjects. We have read the book with interest and profit, and can cordially recommend it to every school inspector, as well as to students of hygiene and all those who are directly or indirectly responsible for the care of children. School inspectors will find on the last page a series of aphorisms which need little modification to form a useful leaflet for use in schools.

Except for the choice of paper, which is unfortunately glazed, the publishers are also to be congratulated on their share in the work.

THE MEDICAL INSPECTION OF SCHOOL CHILDREN.—A large number of medical officers of health and school medical officers attended the last course of lectures by Dr. James Kerr, at the rooms of the Society of Medical Officers of Health on January 11th, 12th, 13th, and 14th. Dr. George Newman, the Chief Medical Officer of the Board of Education, presided at the opening meeting, and delivered an address, a report of which will be found on p. 160. The following lectures were also delivered:—* Medical Inspection: General Principles, History, and Practice, by Dr. James Kerr; † The Coordination of Medical Inspection with Public Health Work, by Dr. H. Meredith Richards; Anthropometry, by Dr. F. C. Shrubbsall; a The Systematic Examination of the Eyes of School Children, by N. Bishop Harman, M.A., M.B., B.Ch.; Ears, by P. Macleod Yearsley, F.R.C.S.; Treatment, by A. H. Hogarth, B.A., M.B., B.Ch.; Teeth, by C. Edward Wallis, M.R.C.S., L.R.C.P., L.D.S.R.C.S. Eng.; Reports and Office Routine, by Mr. H. Greer. Demonstrations of special cases, including ringworm examination, were given by Dr. James Kerr at the London County Council Education Offices, and parties were conducted to the special schools of the London County Council by Drs. J. A. H. Brincker, A. H. Hogarth, and Marion Hunter, where the methods adopted by the London County Council were fully explained. The following firms also exhibited:—Aston & Mander, Ltd., measuring apparatus, weighing machines, and eye-testing apparatus; Bennet Furnishing Co., Ltd., special school furniture; Davidson & Co., eye-testing apparatus and charts; Day & Millward, Ltd., weighing machines and measuring apparatus; Defries & Sons, "Equifex" steam vermin destructor, sprayers, and Pasteur filters; Jeyes Sanitary Compounds Co., Ltd., Disinfectants; Medical Agency, Abbott versimetric charts; Newton, Chambers & Co., Ltd., "Izal" disinfectants; Salter Typewriter Co., typewriter, etc.; School Dentists' Society, dental charts; Stolzenberg Patent File Co., files, record systems, office furniture.

* See p. 162. † See p. 166. a To be published in the March issue.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

A GENERAL MEETING of the Society of Medical Officers of Health took place at the Rooms of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on January 8th, 1909, at 7.30 p.m., when the following members were present:—Dr. Edward Sergeant (President) in the Chair, Drs. G. Sowden, T. Strain, P. Caldwell Smith, A. E. Porter, W. G. Savage, A. Griffith, Herbert Jones, J. Howard Jones, S. C. Lawrence, W. G. Willoughby, F. W. Bywater, F. E. Cane, J. Tate, R. A. Lyster, W. H. Symons, F. E. Fremantle, G. F. McCleary, E. W. Goodall, E. H. T. Nash, J. S. Tew, W. A. Bond, E. H. Snell, T. Thomson, E. C. Seaton and J. E. Robinson.

THE PRESIDENT having taken the chair, the Minutes of the previous Ordinary Meeting held on November 13th, and published in the December number of PUBLIC HEALTH, were taken as read, were approved, and duly signed by the Chairman.

THE HON. SECRETARY read letters of regret from several members of the Society who were unable to attend the meeting.

THE HON. SECRETARY read a list of nominations for membership of the Society.

ELECTIONS.

The following Candidates who had been duly nominated were balloted for, and the President declared them to be elected unanimously:—

FELLOWS.

Thomas Adams, M.R.C.S., L.R.C.P., D.P.H., County Hall, Wakefield; West Riding C.C. (Assist.). A. F. A. Fairweather, M.B., C.M., Pocklington, Yorks; Pocklington R.D. E. Towers Fison, M.D., F.R.C.S., D.P.H., 2, St. John Street, Salisbury; Salisbury M.B. Helena A. Hall, L.R.C.P. & S., 66, Upper Walthamstow Road, Walthamstow; Walthamstow U.D. (Educ.). Alfred Harris, M.B., Ch.B., Isolation Hospital, Southampton. Rhodes Haygarth, M.B., C.M., Ashfield, Crossgates, near Leeds; Garforth U.D. Basil W. Housman, F.R.C.S., The Lower House, Tardebigge, Bromsgrove; Worcestershire C.C. (Educ.) John D. Leigh, M.D., F.R.C.S., D.P.H., Bishop Auckland, co. Durham. C. B. Moss-Blundell, M.R.C.S., L.R.C.P., D.P.H., 33, Bowling Green Street, Leicester. Lionel E. Orton, M.R.C.S., L.R.C.P., Bedworth, Warwickshire; Bulkington U.D. E. D. Parsons, M.R.C.S., L.R.C.P., D.P.H., Borough Hospital, Croydon. Laurence W. Pole, M.B., D.P.H., Lyndene Bath Road, Worcester; Worcester C.B. (Assist.). Robert L. Thornley, M.D., D.P.H., Beverley, Yorks; East Riding C.C. (Assist.). Lewis, G. Travis, M.R.C.S., L.R.C.P., D.P.H., D.T.M., Deganwy, near Llandudno. Lillian E. Wilson, M.B., B.S., D.P.H., 25, Alfred Road, Acton, W.; Acton U.D. (Educ.). William T. Wood, L.R.C.P., L.R.C.S., The Laurels, Creswell, near Mansfield; Kineton Park R.D.

Dr. E. H. T. NASH called attention to the desirability of the Society taking steps to support the action of the British Medical Association where warning notices had been issued in regard to appointments of school medical officers and medical officers of health.

On the motion of Dr. P. CALDWELL SMITH, seconded by Dr. W. A. BOND, it was resolved that the matter be referred to the Council.

Dr. W. G. SAVAGE then read a paper on "The Scientific Control of Diphtheria."* The following took part in the subsequent discussion:—Drs. E. C. Seaton, A. Griffith, E. H. Snell, R. A. Lyster, J. Howard Jones, E. H. T. Nash, J. E. Robinson, S. C. Lawrence, J. S. Tew, E. W. Goodall, P. C. Smith, Herbert Jones, and the President. Dr. Savage replied, and the proceedings concluded with a hearty vote of thanks to him for his paper.

North-Western Branch.—A meeting of the North-Western Branch of the Society of Medical Officers of Health was held at the Victoria Hotel, Manchester, on Friday, December 18th, 1908. In the unavoidable absence of the chairman, Dr. Garstang was elected to the position. *Present:* Drs. Wheatley, Hitchon, Welsh, Brebner, Butterworth, Tattersall, Carnwath, Harris, Buckley, Osborne, Daley, Arnold, Gordon, Rees, Jones, Wood, Holt, Brindley, Wilkinson, Buchan, Dearden, Edlin, Fraser, Coote Hibbert, Barlow and Porter.

The Minutes of the last meeting were read, confirmed and adopted.

Dr. S. A. Henry, of Rochdale, and Dr. Burnett, M.O.H., Bury, were unanimously elected members of the Branch.

The following nominations for membership were received:—Dr. H. Osborne, Assistant M.O.H., Salford; Dr. Stitt, School Medical Officer, Bootle; Dr. Hutt, Assistant M.O.H., Warrington.

A letter was read from Dr. Brindley resigning the position of representative of the North-Western Branch on the local council of the National Registration of Plumbers, and Dr. Tattersall, M.O.H., Salford, was appointed in his place.

Dr. Hibbert read a paper on "The Aid of Bacteriology in Sanitary Administration." After a very full discussion, in which Drs. Buchan, Gordon, Barlow, Arnold, Brindley, Wheatley, Carnwath, Garstang and Edlin took part, a vote of thanks was unanimously passed to Dr. Hibbert for his contribution.

Dr. Herbert Porter, H.M. Alkali Inspector for Liverpool and Widnes district, opened a discussion with reference to the desirability of active co-operation between the M.O.H. and the Alkali Inspector, and drew attention to some very stringent powers contained in the new Alkali Act. Dr. Porter was cordially thanked at the close.

* To be published in the March number of PUBLIC HEALTH.

THE LIBRARY.

All Books and Publications received by the Editor and by the Hon. Librarian will be acknowledged under this heading.

Journals.

British Medical Journal. Lancet. Hospital. Caledonian Medical Journal. Glasgow Medical Journal. Transvaal Medical Journal. Australasian Medical Gazette. Progress. Sanitary Record. Royal Sanitary Institute. Practical Dietetics and Bacterio-Therapeutics. Royal Army Medical Corps. Medical Review of Reviews. Official Circular of the County Councils Association. Pacific Medical Journal. Indian Public Health. American Journal of the Medical Sciences. Municipal Journal. Proceedings of the Royal Society of Medicine. Giornale della Reale Società Italiana d'Igiene. Journal of the Royal Statistical Society. Tropical Medicine and Hygiene. Royal Institute of Public Health. New Zealand Medical Journal. Sanitary Journal. Water.

Reports.

Registrar-General's Weekly Returns. Metropolitan Asylums Board Report. Monthly Bulletin of the State Board of Health of Massachusetts. Dr. R. J. Reece's Report to the Local Government Board on Hebburn U.D. Royal Borough of Kensington, November, 1908. Bombay, 1907. Report of the Board of Health on Plague in New South Wales. Report to the District Council of Partington, by Dr. Coates. City of Aberdeen, November, 1908. Bulletin du Service de Santé et de l'hygiène. Report of the Public Health Committee of the L.C.C. Report on the work of the Medical Branch Education Department, Tasmania. Annual Report of the School Medical Officer for West Bromwich. Administrative County of Durham. Chief Vital Statistics for 1908.

Pamphlets.

Thoughts on Natural Philosophy and the Origin of Life, by A. Biddlecombe. Some Observations of Methods, Cost and Results of Sewage Purification Abroad, by H. W. Clark, Massachusetts. Vaccination, by C. A. Hodgetts, M.D., L.R.C.P., Lond. Observations Relating to Transmission of Sleeping Sickness in Uganda, by A. D. P. Hodges, M.D., Lond. Health in the Orchard, by H. Benjafield, M.B.

Statutory Rules and Orders.

Factory and Workshop Act: Dangerous and Unhealthy Industries. Regulations, dated December 18th, 1908, made by the Secretary of State for the Use of 1908, made by the Secretary of State for the Use of East Indian Wool; the same, for Vitreous Enamelling Metal or Glass; the same, for the Manufacture of Nitro and Amido-derivatives of Benzene, etc. Public Health (Tuberculosis) Regulations, 1908. Factory and Workshop Act: Draft special exception to Florists' Workshops.

The Etiology and Nature of Cancerous and other Growths.

By W. T. Gibson, A.R.C.S.; Bale, Sons and Danielsson, Ltd., 6s. net.

Sanitary Record Year Book and Diary for 1909.

Published by the Sanitary Publishing Co., Ltd., 2s. 6d. net.

The Planning of Fever Hospitals and Disinfecting and Cleansing Stations.

By Albert C. Freeman, M.S.A.; Sanitary Publishing Co., Ltd., 7s. 6d. net.

LAW REPORTS.

COURT OF APPEAL.

July 12th, 1908, January 12th, 1909.

BEFORE THE MASTER OF THE ROLLS, FARWELL AND KENNEDY, L.J.J.

ATTORNEY-GENERAL v. BIRMINGHAM, THARNE AND REA DISTRICT DRAINAGE BOARD.

Public Health Act, 1875, Section 17.—Pollution of Stream.—Sewage effluent.—Injunction.—Suspension.

This was an appeal from an order of the late Mr. Justice Kekewich, in an action for an injunction to restrain the defendant board from polluting the river Tame by discharging into it an effluent from their sewage works which had not been sufficiently purified. The action was brought in the name of the Attorney-General, at the instance of the Tamworth Corporation and Rural District Council. The defendants were a joint board, established under section 279 of the Public Health Act, 1875, for the purpose of treating the sewage of various boroughs and sanitary districts, and of the city of Birmingham. They had a large sewage farm of about 3,000 acres, on the bank of the River Tame. It appeared that the defendants could deal satisfactorily with the dry weather flow through the farm, but not in times of heavy rain. In these cases they were compelled to discharge the overflow into the river only partly purified by means of lagoons.

KEKEWICH, J., was of opinion that the defendants were committing a breach of Section 17, of the Public Health Act, 1875, by sending excrementitious or other foul or noxious matter into the river, and granted an injunction to restrain this, and he refused to suspend its operation. The defendant Board appealed.

The appeal came on in July last, when it was stated that the old system of purifying by lagoons had been given up and that new works were being executed, but that further time was required. On the suggestion of the Court the case stood over for six months.

On the appeal coming on again, it was further stated for the defendants that since July last the report of the Royal Commission on Sewage Disposal had been issued, which recommended that "stand-by tanks" to receive storm overflows should be provided; the appellants were now extending the area of their bacteria beds and were making a stand-by tank capable of holding some 13,000,000 gallons at a cost of about £100,000; it was hoped that this work would be completed and in full operation in the course of some three months from this time, and it was asked that as the Sewage Board were endeavouring to comply with the recommendations of the report, some further time should be given them to test the result of these new works.

For the plaintiffs it was said that the single contact system adopted by the Board was insufficient.

The Court ordered the matter to stand over until June.

RECENT PUBLIC HEALTH LITERATURE.

Alcohol.

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DOLT (M. L.). Simple synthetic media for the growth of B. Coli and for its isolation from water. *Jour. of Infect. Dis.*, 1908, v, 616.—HAMILTON (ALICE). On the occurrence of thermo stable and simple bactericidal and opsonic substances. *Jour. of Infect. Dis.*, 1908, v, 570.—HOLICK (J. O.). Streptococcal ("Septic") throats. *Lancet*, 1908, ii, 1814.—SEMON (Sir F.). The question of pneumococcus invasion of the throat. *Med. Magazine*, 1908, xvii, 690.—WEAVER (G. H.) and T. H. BOUGHTON. The infections of heterologous streptococci, killed by galactose, in erysipelas and in scarlet fever. *Jour. of Infect. Dis.*, 1908, v, 608.—WEAVER (G. H.) and R. TUNNICLIFF. Effects of infections of homologous streptococci, killed by heat, in streptococcus complications in contagious diseases. *Jour. of Infect. Dis.*, 1908, v, 585.—A study of streptococcus immunization. *Jour. of Infect. Dis.*, 1908, v, 589.—WHERRY (W. B.). Experiments on the use of bacillus pestis-cavie as a rat virus. *Jour. of Infect. Dis.*, 1908, v, 519.—Streptococci occurring as diplococci in rats (M. norvegicus). *Jour. of Infect. Dis.*, 1908, v, 515.

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BENTALL (W. C.). Cancer in Travancore: a resume of 1700 cases. *Indian Med. Gaz.*, 1908, xliii, 452.

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BLACKHAM (Maj. R. J.). The micro-organisms of dysentery. *Jour. Roy. Army Med. Corps*, 1908, xi, 582.

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BOUVIER (H.). Les matieres alimentaires au premier congrès International du froid. *Rev. Scientifique*, 1908, 5me ser. x, 804.

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GRAHAM (W. H.). Report on guinea worm. *Jour. Trop. Med.*, 1908, xi, 353.

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ANNUS MEDICUS, 1908. Public Health. *Lancet*, 1908, ii, 1910.

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MERCER (A. C.). The opsonic theory and its practical application. *New York Med. Jour.*, 1908, xxviii, 1214.

Plague.

WHERRY (W. B.). Plague among the ground squirrels of California (plate). *Jour. of Infect. Dis.*, 1908, v, 485.

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Water.

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VOL. XXII.

THE REPORT OF THE POOR LAW COMMISSION.

THE Royal Commission on the Poor Laws and the Relief of Distress, after three years of strenuous labour, has just published one of the most important official documents that have ever appeared in this country. It takes the form of an enormous blue-book, which contains not only the Majority Report, 670 pages long, and the Minority Report, signed by four Commissioners, and extending to 517 pages, but also five Memoranda, prepared by members who have signed the Majority Report, dealing with special questions arising from that Report. The appearance of this blue-book is an important event from whatever point of view it may be regarded, but to the medical officer of health it is a matter of the highest importance. The various recommendations contained in the two Reports will have a profound influence on the development of public health administration, and we hope they will be most carefully considered by every medical officer of health in the country.

In certain important respects the views expressed in the two Reports are in entire accord. Both recommend the break-up of the present Poor Law system, the abolition of Boards of Guardians and of the general work-house. Both agree that present methods should be replaced by a more humane and discriminating system of administration, and in particular that the treatment of the children, the aged and the sick should be much improved. These are important points of agreement, but there are equally important points of difference, one of which relates to the provision of medical assistance. The Majority Report recommends that medical assistance should be re-organised on a provident basis. The statutory committee of the County or

County Borough Council, which the Report recommends shall be the new Poor Law Authority, or, as it is to be called, the Public Assistance Authority, shall be charged with the duty of organising "an outdoor and provident medical service, easily accessible in all parts of the county or county borough, this service to include the provision of competent midwives," and of developing an adequate nursing service throughout its area. The Report also recommends that it shall be the duty of the authority to "subscribe, when necessary, toward these purposes." In carrying out these objects the authority must consider the needs of the district in the way of hospitals, must develop a system of paying and free cottage hospitals, and must invite "any free or provident medical institution, including private medical clubs," to fall in with the general scheme. Efforts are to be made to enlist the services of all the "competent medical practitioners" (the method whereby the competent are to be selected is not indicated) in the district for the members of the dispensaries, and any member is to be free to choose his own doctor. Membership of these rate-aided dispensaries will apparently not only confer the right to unlimited outdoor medical service, but will also entitle the member, on the recommendation of his doctor, to treatment in an infirmary or a voluntary or general hospital. For persons who are not members of a provident society it is recommended that they "shall apply to and at once be treated by a district medical officer," and it is also recommended that "no disfranchisement should be attached to any form of medical assistance." In short, the Majority Report recommends the establishment of a system of free medical relief on a basis of contract practice. The local rates are to be used to further an indefinite multiplication of the club patient.

The first objection we have to raise against this scheme is that it would be unworkable, and in this we are supported by the opinions of two of the most experienced and distinguished of the Commissioners who have signed the Majority Report. Both Miss Octavia Hill and Dr. Downes have submitted special memoranda, in which this view is expressed. Miss Hill objects that the scheme "is not workable, and that it would open the door too widely to free medical relief"; while to Dr. Downes, who was the sole representative of the medical profession on the Commission, it appears to offer "a large measure of free medical relief without adequate safeguard either to the medical profession or to the ratepayer." He fears, and many doctors will share his fear, that "provident dispensaries established by the enrolment of paupers and subsidised by the rates would become provident in name only." But assuming the scheme could be got to work, its effect, we believe, would be disastrous to the medical profession and to the public. The evils of contract practice, which already constitute a burning question in the profession, would be intensified. This is a point that has not been neglected by the Majority Commissioners, who think there is some justification for the statement that the doctors of provident dispensaries and friendly societies are frequently underpaid. They hasten to add, however, that this is partly the fault of the doctors themselves, and they think that difficulties of this kind would be met by requesting the British Medical Association to suggest a scale of fees and wage limit, and by the co-option of representatives of the Association on the local medical assistance committees. We venture to think that these safeguards would prove illusory, and that the new scheme would bring about an even closer association than that which already exists between organised philanthropy on the one hand, and unpaid and underpaid medical work on the other.

But from a public health point of view, the chief objection of the scheme of the Majority Report is that it would effectually check the development of public health administration. The Report actually recommends the transference of certain most important public health functions from the public health authority to the new Poor Law authority. At the present time many sanitary authorities are providing sanatorium treatment for consumptive patients,

and the number of such authorities shows a marked tendency to increase; while tuberculosis dispensaries are beginning to take their place in the great scheme which public health authorities are now building up for the control of tuberculosis. According to the Majority Report, this is work which should be done by the Poor Law Authority. This is expressly stated on page 275 of the Report. The same is said of school clinics. There is a general agreement among the workers in school hygiene that the school clinic is a necessary corollary of an effective scheme of the medical inspection of school children, and that the clinic should be under the direct control of the authority responsible for the inspection. Such is not the view of the Majority Report, which is summarised on page 286 as follows:

"The Sanitary Authorities, whose functions are mainly concerned with the prevention of infectious disease, would be responsible for the medical inspection of all children. On the other hand, the Public Assistance Authority, whose functions would be to provide medical treatment, would provide such treatment for all school children, so far as they require to be treated at the expense of the rates."

It would appear that the Commissioners who have signed the Majority Report are without adequate appreciation of the achievements of public health administration in this country, and of the great progress that has been made in recent years, and it is regrettable that more weight was not attached to the opinions of the fifty-one medical officers of health who gave evidence to the Commission. The view put forward by most of these witnesses is that the remedy for what the Majority Report rightly terms "the existing chaos in the organisation of medical assistance of the poor" is to be found in a development and extension of the work now carried out by the public health authorities. This view, which is cursorily dismissed in the Majority Report, is very fully and sympathetically treated in the Minority Report, where it is accepted as a basis for the recommendations relating to medical assistance. In the Minority Report the whole question of the control of disease is subjected to a searching analysis, and the recommendations it contains are framed on lines that have stood the test of experience, and are in harmony with existing tendencies in local administration.

THE SCIENTIFIC CONTROL OF DIPHTHERIA.*

By WILLIAM G. SAVAGE, B.Sc., M.D., D.P.H.,
Medical Officer of Health, Colchester.

ALTHOUGH most of the infectious diseases have been known for a very long time, yet is our accurate scientific information about them but limited. Indeed, for many, such as scarlet fever, measles and whooping cough, we are still unable to isolate the specific organisms which cause them.

Diphtheria is a disease which stands out in striking contrast. Not only is its microbial origin fully proved, but bacteriological diagnosis is sufficiently elaborated to enable the presence of the bacillus to be readily and reliably detected, while, by a strictly scientific process, a curative serum of proved effectiveness is available. Its methods of spread have been very carefully studied, and have resulted in the accumulation of a large body of reliable facts. The prevention of diphtheria is emphatically one in regard to which our knowledge enables us to submit a definite scientific scheme of control.

How far is such a scientific system of control practicable? How far is it exercised in England? How far should it be exercised? These are the essential questions to which I would invite your attention.

Until comparatively recently the prevention of the infectious diseases has been dealt with as if they could all be checked along the same lines, the essential—frequently the entire—methods of limitation being summed up in the triple combination of notification, isolation, and disinfection.

Personally, I feel that the essential principle which we have only recently really grasped is that just as each disease has its own peculiar micro-organism, so it has its own peculiar methods of spread, and success in the limitation of infectious disease is only to be looked for when the appropriate methods are applied to each individual disease. In diphtheria this is particularly the case.

Limits of space prevent any extended discussion of the different factors in the spread of this disease, and force me to confine myself to more or less dogmatic statement.

Diphtheria is only acquired directly or indirectly from another case, and cannot

arise from bad drains or insanitary conditions. These may predispose, by lowering the general resistance, but even the evidence for this is meagre and inconclusive. The disease may be acquired by bacilli carried on infected articles, but the vitality of the Klebs-Löffler bacillus outside the body is not great, and, apart from milk and apart from articles immediately infected by the human case or carrier, such means of transmission are subsidiary and comparatively unimportant.

Milk is responsible for a certain number of diphtheria outbreaks. This disease in the vast majority of cases is spread directly from person to person, either from a patient suffering from diphtheria or from a contact-carrier. I include as directly spread instances of nearly direct infection, such as when a child is infected by using a pencil, slate, spoon, handkerchief, etc., previously, or quite recently, used by a sufferer from diphtheria or by a carrier case. In other words, this disease is essentially transmitted by direct personal contact from persons harbouring diphtheria bacilli, either as definite cases of diphtheria, atypical cases, or healthy contact carriers.

In the light of our knowledge of the bacteriology and epidemiology of diphtheria, I would submit the following as the essential pillars upon which to support the scientific control of this disease:—

1. A system by which all medical men practicing in the sanitary district can obtain bacteriological diagnosis in regard to suspected and doubtful cases of diphtheria.

Such a system must be available without cost, be readily accessible, and the results must be transmitted without unnecessary delay.

2. The usual public health procedures of notification, isolation of the case, and subsequent disinfection after cure or removal to hospital.

3. A routine bacteriological examination of the immediate or close contacts, and, when necessary, of the less direct or more remote contacts and of all possible human sources of infection.

By immediate contacts is meant the other persons, or at least the children,

* A Paper read before the Society of Medical Officers of Health on January 8th, 1909.

in the same house, and any children who have been in close contact. The more remote contacts would include children in the same class or school, etc.

4. The isolation of all *contact-carriers* until free from bacilli.

By the term *contact-carriers* is meant persons with no clinical signs of disease, but who show the presence of diphtheria bacilli when bacteriologically examined. The isolation may be carried out in their own homes, or in a special isolation home.

5. Cases in hospital or isolated at home only to be discharged or released after a sequence of negative bacteriological examinations as regards the presence of the diphtheria bacillus.

The investigation of possibly diseased animals, milk, etc., are procedures only required in special cases.

Such a system of dealing with diphtheria has been in vogue in Colchester since 1901, when it was introduced by Dr. Cobbett (in consequence of an extended outbreak of diphtheria), extended by Dr. Graham-Smith, and maintained by the writer since his appointment as Medical Officer of Health in 1903.

I propose to consider now in some detail the procedures advocated.

Facilities for Bacteriological Diagnosis.

The need for such facilities is surely obvious, for it must be recognised that while many cases are perfectly definite clinically, in a certain proportion diagnosis is impossible without bacteriological examination to determine if the Klebs-Löffler bacillus is present.

Where such facilities do not exist, or are not made use of, persons are notified and often sent to hospital which undoubtedly are not suffering from diphtheria at all, while many slight or atypical cases and cases with symptoms of tonsillitis, rhinitis, etc., are unrecognised as infective. The non-recognition of such cases is a potent factor in spreading the disease.

It is not a question of clinical *versus* bacteriological, but clinical *plus* bacteriological diagnosis.

Illustrations of the spread of disease by cases unrecognised as diphtheria by their medical attendant, owing to reliance being

placed entirely upon clinical appearances, are, unfortunately, only too common. The following is a good example of a case in which bacteriological examinations would have been of great service if made use of at the outset, while their subsequent employment made clear the paths of infection and prevented further cases.

J. C., age nine, fell ill with sore throat about March 8th. Symptoms mild and patient not attended by a medical man until he had been ill for about two weeks. No swabs taken. He became somewhat better, but never quite well, and returned to school when it re-opened in April. The boy became worse, had to leave school May 5th, and was again confined to bed. He was seen by a doctor, but no swabs were taken nor, I am informed, were clinical signs of diphtheria present. His brother, W. C., went to London May 9th, and was removed to hospital there on 12th suffering from diphtheria. This was notified to me on May 13th, and on visiting the house of Mr. C. and swabbing all the people in the house, I found J. C. with typical bacilli in his throat, all the others being negative. The above history was then elicited. J. C. showed none of the clinical signs of diphtheria. He was isolated at home until three negative bacteriological results were obtained, a matter of about four weeks.

Meanwhile, on May 13th, a schoolmate of the same age fell ill with a slight attack of diphtheria, the diagnosis being bacteriologically verified. No other possible origin could be ascertained for this case. Other interpretations are possible, but I believe the initial attack of J. C. was diphtheria unrecognised as such with persistence of the bacilli, and the two other cases would have been avoided by timely bacteriological investigation.

It will be unnecessary for me to discuss the value of notification, isolation and subsequent disinfection, since they are universally practised and their value admitted.

The Routine Bacteriological Examination of Contacts.—The extensive bacteriological data now available shows conclusively that a certain proportion of those who are brought into contact with diphtheria patients harbour the bacilli in their throats or nasal cavities although themselves not ill. The percentage is highest in the immediate contacts, *i.e.*, brothers and sisters and others brought into close contact with the patient, and diminishes rapidly as we enlarge the interpretation of the word contact by including the more remote contacts such as school-fellows, until when the term is so widened as to include the extremely remote contacts such as the general inhabitants, the percentage showing the bacilli is a negli-

gible one. For definite statistics to establish the above facts reference should be made to the invaluable work upon the bacteriology of diphtheria, edited by Professor Nuttall and Dr. Graham-Smith.* In this volume Graham-Smith summarises the data of the previous pages as follows (p. 188):—"The statistics quoted on close contacts, namely, members of infected families, relatives and attendants, show that amongst such persons 36.6 per cent. are liable to become infected, while the mean infection amongst inmates of hospital wards and institutions is 14 per cent., and amongst scholars of infected schools 8.7 per cent."

The statistics from different places show considerable variation and, obviously, the proportion of infected contacts will vary greatly with the percentage of cases isolated, the promptitude of isolation, of investigation, etc.

I have kept careful records in Colchester for the past six years, and the percentage of close contacts (persons in same house and intimate playmates) harbouring typical Klebs-Löffler bacilli for the years 1903-08 (to end of November) works out at 8.6 per cent. In all 536 such contacts were examined and forty-six showed diphtheria bacilli.

The percentage is a much lower one than that recorded above and is, I believe, partly to be accounted for by the fact that all cases were investigated with great promptitude and also by the generally very complete measures taken against this disease.

Of much importance in this connection is the answer to the question, How far diphtheria bacilli are present in the throats, etc., of the ordinary healthy population? It may be said that, if morphology alone is considered, in a quite small proportion of cases (not more than 2 to 3 per cent.), persons who, as far as is known, have not come into contact with diphtheria cases are found to harbour bacilli morphologically indistinguishable from the true Klebs-Löffler organism. If *virulence* is considered, however, not more than 0.2 per cent. harbour virulent diphtheria bacilli. This is illustrated by the following table from Graham-Smith's article already quoted (p. 194).

* When the scheme for this Paper was first projected I had intended to substantiate my remarks by quotations from the original references and had indeed collected a large number for this purpose. Since then this monumental work has been issued, and I have therefore almost entirely confined my references to this volume, as much more readily accessible, while in it they are set out in sufficient detail for the reader to form his own opinions.

OBSERVER.	No. of non-exposed persons examined.	Persons harbouring virulent diphtheria bacilli.	Persons harbouring non-virulent diphtheria bacilli.
Park and Beebe (1895)	274	2	23
Kober (1899)	588	0	3
Denny (1900)	235	0	1
Cobbett (1901)	43	0	0
Cobbett (unpublished)	90	0	0
Pugh (1902)	415	0	17
Graham-Smith (1903)	362	0	1
Pennington (1907)	125	2	11
	2,132	4	56
		(0.18 per cent.)	(2.62 per cent.)

The facts are very different in regard to the virulence of the diphtheria bacilli found in the contact-carriers. This is strikingly illustrated by the following table from the same work (p. 232).

Table showing the virulence of diphtheria bacilli isolated from recently infected contacts.

OBSERVER.	No. of diphtheria bacilli tested for virulence.	Fully virulent.	Totally non-virulent or causing a slight infiltration.
Park and Beebe	12	11	1
Aaser	17	17	0
Meade Bolton	88	88	0
Müller	12	6	6
Kober	15	15	0
Cobbett	9	6	3
Graham-Smith	56	38	18
Pennington	18	1	7
	227	182	35
		(80.1 per cent.)	(15.3 per cent.)

Graham-Smith remarks in reference to this table and other details supplied:—"These records clearly show that the majority of well persons harbouring diphtheria bacilli, which have been derived by contact from clinical cases, retain in their throats virulent organisms, and that the transference of a virulent diphtheria bacillus from a diseased to an immune person does not tend to weaken its virulence." We have also the further fact that these bacilli retain their virulence for prolonged periods. Cobbett, for example, in two contacts found the bacilli virulent in one on the 16th, 36th, and 58th days, and in the other on the 1st, 18th, 28th, 60th, 69th, and 82nd days.

Pugh found virulent diphtheria bacilli in the throat of a nurse for nine weeks after she had been nursing a case of diphtheria.

Numerous other recorded results might be quoted. The following example may be

quoted from my own records as illustrating both the presence of persistent infection and virulence.

W. B., age six years, notified as a case of diphtheria, August 14th, 1908, and removed to hospital the same day. The parents and remaining three children were bacteriologically examined. The father showed no bacilli, the mother and all three children showed typical diphtheria bacilli but no clinical signs of disease. They were isolated at home, but subsequently the two younger children were isolated in hospital. The following shows the results of the bacteriological examinations:—

		Dates of examination in days from the outbreak of the disease.																	
Persons	..	0	10	18	25	27	32	33	40	47	54	61	67	75	82	89	92		
Mrs. B.	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
F. B. (14 yrs.)	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
E. B. (9 yrs.)	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
H. B. (4 yrs.)	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		

Mrs. B. yielded two further negative results on 55th and 57th days.

E. B. showed positive results when examined after 96, 101, 108, 115, 122, 135 days.

Virulence experiments were carried out. The diphtheria bacilli isolated from H. B. 32 days, and those isolated from Mrs. B., 40 days after the outbreak of the disease, were tested upon guinea-pigs in the ordinary way and found fully virulent.

As already mentioned, the percentage of carrier cases in the less immediate contacts is much lower, and only under certain circumstances is it necessary to examine these children. Sometimes such examinations are of great value. The following examples from my own experience may be quoted as typical instances.

- (a) Two children, both attending Class III., Infants' Department, of one of the Council's elementary schools, were notified to me in October, 1906, within two days of one another, as suffering from diphtheria. A number of absentees from this class were examined, and three days after the last notification the swab from one of the children who looked unwell, but showed no clinical signs whatever of diphtheria, yielded numerous Klebs-Löffler bacilli. This child subsequently developed a mild attack of diphtheria. The whole sixty children in this class were then bacteriologically examined. One child away from school was found to be suffering from a well-marked attack of diphtheria, although the parents were quite unaware of it, and had not called in a doctor. This made four cases in all from this class, while five of the other children showed the presence of diphtheria bacilli in their throats or noses, although they themselves were, and remained, quite well. They were either isolated at home or removed to the Borough Isolation Home, and were not allowed to mix with other children until they were free from the bacilli. In

one case the bacilli persisted for 2½ months. The virulence of this last case was tested five weeks after being recognised, and was negative. The school or even this class was not closed, so that no interference with school work took place. All the cases were in the one class, illustrating the considerable influence of close contact in school. No cases subsequently developed in that class or school during the year.

- (b) Two children boarders in a private girls' school, containing both boarders and day girls, developed slight attacks of diphtheria. The other girls, forty-four in number, were bacteriologically examined, and three were found to harbour the bacilli, but themselves showed no clinical signs. All five were isolated, and no fresh cases developed.

The fact of greatest importance in regard to these carrier cases, next to the proofs of their existence, is the evidence of their infectivity.

It has been shown that the diphtheria bacilli present in these cases are not only morphologically indistinguishable from the bacilli isolated from typical cases of diphtheria, but that they are equally virulent to guinea-pigs, and are capable of producing abundant toxins. It would seem, then, a reasonable deduction that such bacilli are capable of infecting human beings and causing diphtheria, although naturally absolutely clear evidence of specific instances are difficult to find.

Dr. Graham-Smith (pp. 315-318) quotes some interesting instances, but where, as in Colchester, such contacts are promptly isolated, examples of their infectivity are not to be expected. The following was probably an example of this, but I am unable to supply the complete proof:—

E. G., age twenty, a server in a large pastry-cook shop and living in, developed diphtheria. Very careful inquiry failed to find any cause of infection other than the one given below, while the other persons in the house showed no signs of diphtheria clinically or bacteriologically. Four days before the onset of the first symptoms she had spent the week-end with her aunt, who had been nursing a case of diphtheria a few days previously. This person lived outside the borough, and I was unable to make a bacteriological examination. She was examined clinically by the local medical officer of health, who found no signs of diphtheria. It is probable that she was a contact carrier infected from the case she had been nursing, and transmitted the infection to E. G.

Bearing upon the question of the infectivity of contacts is the fact that although, in my experience, these contact carriers do not as a

rule subsequently develop the disease, yet in some cases they show well-marked clinical diphtheria within a few days of finding the presence of diphtheria bacilli. That is, they are undoubtedly infectious to themselves in a certain number of cases before the slightest trace of membrane or other clinical signs of diphtheria. Infectivity in these cases is present without clinical signs.

The following may be quoted in illustration:

In February, 1905, a girl of eight was notified as a case of diphtheria; the disease was pronounced, and the child died the same night. The parents and eight remaining children were examined clinically by me next morning and swabs taken. Clinically there were no signs of diphtheria in any of them. Two of the cases only, C. S. (2½ years) and the baby (two weeks), showed diphtheria bacilli. On re-examining C. S. (twenty-four hours after first examination) he now showed membrane and developed a marked attack. The signs in the baby were indefinite, but became more marked, and she died four days after the bacilli were found. The mother would not let the baby go to hospital, but attended to it herself. She developed diphtheria but recovered.

We must conclude that the available evidence shows conclusively that a proportion of the contacts of diphtheria cases show the presence of diphtheria bacilli in an acutely virulent condition, and that such cases are capable, when given the opportunity, of transmitting these bacilli to healthy persons and setting up diphtheria in susceptible cases. In other words, these contact carriers are all *potentially* infective. The proportion of such contact carriers is higher for home than for more remote contacts such as schoolfellows, and diminishes as we broaden the interpretation of the word. There is no evidence that diphtheria bacilli are in any way ubiquitous, but they haunt the vicinity (as Newsholme has said of tubercle bacilli in regard to phthisis cases) of the diphtheria case. On what grounds can we neglect the existence of these cases and their danger to the community? I propose to discuss some of the objections which may possibly be raised.

1. Medical men in practice may object as unwarranted interference with their patients, and so friction may be caused.

My experience in Colchester is that no friction is caused. Of course it is necessary to clearly explain the objects of the procedure before it is introduced, and a little inconvenience and disturbance may be caused at first, but it

rapidly quiets down. My procedure in Colchester is to arrange for the medical attendant to collect his own swabs and send to me, or, if he prefers it, to collect myself. What happens in practice is that he usually swabs his better-class patients himself, and that I visit and swab all the other cases, thus arriving at a recognised working arrangement. I have never had the slightest trouble from this cause. The medical man has no business to regard any such procedure as an unwarranted interference with his patients. It is the business of the public health authority to prevent the spread of infection, and if he will not assist he must not interfere with measures for that object, and it is no more interference than disinfection after removal or recovery.

2. It may be objected that this is a procedure in regard to which we have no legal standing or power. We have no power to examine, we have no power to isolate when contacts harbouring the bacilli are found.

In actual practice this does not constitute a difficulty. In the few cases in which any difficulty has been experienced, the fact that these cases can be excluded from school is a potent lever.

Section 57 of the Public Health Amendment Act, 1907, should prove a valuable section, since it enacts "that no person being the parent or having the care or charge of a child, within the district of the local authority, who is or has been suffering from infectious disease, or has been exposed to infection shall, after a notice from the medical officer that the child is not to be sent to school, permit such child to attend school without having procured from the medical officer a certificate that, in his opinion, such child may attend without undue risk of communicating such disease to others." Here the power to prohibit school attendance is associated with a penalty for defaulters.

I am of opinion that we should have more power to compel the isolation of infective contacts.

3. It may be urged that even with the procedure advocated there is no *finality*. Thus, it may be advanced, that a single swab is *not* sufficient, that repeated examinations must be made, that the *nose* must also be separately examined, etc. In other words, that when we have examined swabs from contacts, we have no certain evidence that some of those which reacted negative do not really harbour diphtheria bacilli. No doubt there is considerable truth in such an argument, but I hardly think it seriously invalidates the value of the examination of contacts. Possibly, a few cases are overlooked, but certainly all those in which the bacilli are numerous, *i.e.*, the most important cases, would not be overlooked. Of course this presumes that the swabs are properly taken.

A number of administrative objections may be raised, for example:—

- (a) That it would take up a great deal of the medical officer of health's time and require a personal visit. In reply I would say that it is time most properly so taken up. It is exactly the line of work that is the especial province of the Medical Officer of Health, and too long have we allowed ourselves to be entangled in unimportant matters as to drains and water-closets, which really should be relegated to the sanitary inspector.

In large towns, medical assistants are or should be available for this work. It need not take up very much time. In my opinion, it is only necessary to examine, as a routine measure, the immediate contacts (*i.e.*, those in the infected house), only in exceptional cases will a more extensive school inquiry be called for.

The actual examination of the swabbings and serum cultures in the larger towns cannot always be done by the medical officer himself. Some measure of bacteriological work is now, however, carried out in most towns, and the extended work could be easily arranged for.

- (b) It means considerable extra cost. For example, in places without a

laboratory, one would have to be constructed; many medical officers of health are not familiar with any bacteriological work, and the work would have to be sent away and paid for.

There is no need for a laboratory in every local district; such work could easily be done in central laboratories attached to the office of the county medical officer and controlled by him. This would answer for the rural and smaller districts, while the larger districts, with whole time officers, almost all have men capable of themselves doing the work. In Yorkshire and other counties admirable arrangements are made. In Appendix I, I show that in 80 per cent. of areas bacteriological facilities are available, so that it is only an extension of existing arrangements which is required. Any extra cost incurred would be more than justified by direct value gained, and it would certainly be for just as important an object as for the isolation of actual cases of diphtheria.

If these contact carriers are sources of infection, it is right that we should take steps to prevent their so acting. Yet in not more than 11 per cent. of districts is anything done. The usual procedure of removing a case of diphtheria to hospital without bacteriological examination of the contacts seems to me a most inadequate and rather futile proceeding. The case is removed to hospital and maintained at heavy expense until free from infection, while time and money are lavished to kill any diphtheria bacilli which may be present on clothing or furniture, agencies which rarely spread the disease. Meanwhile, amongst the other children in the house, one or more probably contain in their throats the same living bacilli as those in regard to the destruction of which such pains and expense have been spent. These, naturally, re-infect the home. The house is marked off as free from infection, and the infected children—children much more dangerous to the community than the

recognised case isolated with so much trouble and expense—are allowed to go to school and spread the disease unchecked by anything but the limitations of opportunity, and the fortunate comparative insusceptibility of many of their playmates.

The Treatment of Contact Carriers.—If the contacts are examined and the contact carriers ascertained, the problem of what to do with them when found, naturally claims attention. Three courses are open to us: to do nothing, to isolate until free from infection, either at their own homes or in special isolation homes, or to limit their range of infectivity by preventing the contacts mixing with children as far as possible—*e.g.*, to prohibit from school and Sunday school attendance.

To do nothing and to allow such cases to mix unreservedly with other children is obviously impossible. It should be as impossible as to allow a case of diphtheria to return to school as soon as the child is well enough to get up, or a case of scarlet fever as soon as pyrexia is over.

To prohibit the attendance of carrier children at school is a valuable measure, but it is not sufficient to meet the case effectively. Such children will play extensively with uninfected children out of doors, and although the chances of conveying infection are in this way greatly diminished, they are only diminished, not removed.

The broad sound principle of isolating infected persons is here as applicable as for cases of scarlet fever or diphtheria itself.

In certain cases these carrier children can be isolated at their own homes, but in many instances this cannot be carried out. Their isolation in their own homes is a more difficult thing to have done effectively than is the isolation of a case of infectious disease since these children are quite well, and the parents do not grasp the danger. Isolation is maintained for a week or so, but then often relaxed. In a good many cases, however, I have found it quite possible to obtain a great measure of isolation of children in their own homes.

The obviously satisfactory course is to remove these children to a special isolation home where they can be allowed to mix, take exercise, etc., but where they are maintained until free from infection. Such a home is provided in Cambridge.

In Colchester an isolation home was provided in 1902, at the recommendation of Dr. Cobbett. In 1906, this separate home was given up, not because it was found without value, but because I advised that the provision of the new separate administrative block of the smallpox hospital could be effectively used for the same purpose. The fact that we have now so few cases of diphtheria, and so few carriers, made this quite possible. The principle of a separate isolation home for contact carriers was in no way abandoned; indeed, the sanitary committee were so convinced as to the great benefit derived from the isolation of such cases, that they only gave up the isolation home when satisfied as to the feasibility of using the administrative part of the smallpox hospital. When we have only one or two contacts, they are isolated in the infectious hospital.

I am of opinion that the smallpox hospitals are suitable for the isolation of such contact carriers. Such hospitals are usually empty and afford adequate accommodation. It may be urged that they may be wanted very urgently, and then the presence of carrier cases would prevent their being promptly used for their special purposes. Of course, under some circumstances, their utilisation for other than smallpox would be unsatisfactory; but it must be remembered that these contact carriers are in no way ill, and if a case occurred they could be very promptly sent home, or to a home isolated temporarily for that purpose. There would not be the same difficulty as if they were notified cases of disease and subject to the legal enactments applicable to such cases.

The probable number of such contact carriers has been indirectly already dealt with. On an average there are not more than five "close" contacts for each case, and we may roughly assume that not more than 25 per cent. will show diphtheria bacilli. For about 100 cases of diphtheria there will then be about 125 children harbouring diphtheria bacilli to be isolated. In my Colchester experience the proportion is less.

The contacts must be isolated until the bacilli disappear, and this may take a long time. This point is more conveniently discussed with the time of persistence of bacilli in the actual cases.

The Evidence of Freedom from Infection.—The last item in my scheme for the scientific

control of diphtheria refers to evidence upon which we should release diphtheria cases as free from infection.

The practice in vogue varies greatly in different parts of the country. In some cases an arbitrary time limit is fixed—*e.g.*, so many weeks isolation, or so many weeks after the disappearance of symptoms.

My inquiries (*see Appendix I*) showed that in 60 per cent. of places the discharge from hospital is based upon bacteriological examinations; in the remaining 40 per cent. the discharge is based upon clinical grounds or upon periods of time. The percentages are curiously alike for the different classes of districts.

It is now clearly recognised that diphtheria bacilli may persist for very long periods in convalescents, and the only scientific procedure is to wait until they have disappeared. It is obviously impossible for the clinician to say when the bacilli have disappeared. The only logical position upon which he can take his stand is that after the definite number of weeks which he takes as his basis for discharge, the bacilli are no longer capable of causing diphtheria. That is, bacilli may, or may not be present, but the case is not infectious. From the facts which have been considered earlier in this paper, it is evident that this is an unscientific standpoint. The bacilli which persist are frequently fully virulent. Graham Smith (*ibid.* p. 421) gives a most interesting table, in which he shows that while the mean period during which virulence was maintained in notified cases was 31.6 days, the period of persistence of virulent bacilli varied from a few days to eighty, ninety, or one hundred days in some instances.

From a survey of the published statistics he finds that as regards the presence of morphologically typical bacilli, in three weeks about 30 per cent. of diphtheria patients are free from the bacilli; in 20 per cent. the bacilli persist for four weeks; in 16 per cent. for five weeks; and in 11 per cent. for seven weeks. One per cent. harbour them for fifteen weeks; and in exceptional cases they remain in the throat for thirty weeks or even longer.

From my statistical inquiries, 78 cent. of the cases discharged without bacteriological examinations are sent home within five weeks. From these figures it follows that at least 30 per cent. of these will be sent home with diphtheria bacilli and mostly virulent bacilli, in their

throat or nasal cavities. If a longer period of hospital detention is required, the percentage of infective persons discharged will be less, but money will be wasted by keeping other persons perfectly well and free from infection an undue period in hospital. My practice in Colchester is to isolate the infected persons, (cases or contacts) until morphologically typical diphtheria bacilli have disappeared from the throat, as shown by three consecutive negative examinations, examinations being also made from the nose if there is any rhinorrhœa or sores about the nose. In the very few cases in which they persist for quite prolonged periods I test their virulence, and if non-virulent, discharge from hospital. The longest periods of isolation which I have had to enforce have been 104, 111 and 140 days, and a few cases of 80 to 100 days. The average duration of stay with the cases discharged on the above basis have been:—

1903	...	...	34 days
1904	...	...	33 "
1905	...	...	25 "
1906	...	...	39 "
1907	...	...	28 "
1908	...	...	35 "

These figures show that the mean average duration of stay was not high, and hardly longer than would have been the case if discharge had been based upon clinical grounds or a fixed period of time. What is found in practice is that some cases rapidly clear themselves of bacilli and can be discharged as soon as they are well, and that these cases make up for the prolonged cases of infection, in this way not increasing the cost of maintenance. My inquiries showed, however, that the period of detention is rather higher for the cases discharged on a bacteriological than for those on a clinical basis. It will no doubt be urged against the use of bacteriological criteria for discharge from hospital, that even three negative swabs is no evidence of freedom from infection. The fact that more than one negative swab is necessary is, of course, an admission of the imperfections of the bacteriological method. For reasons with which I need not detain you, one negative is valuable but insufficient, and at least two negatives are required. Even three consecutive negative results do not give absolute certitude as to freedom from infection, but the likelihood of persisting bacilli is remote.

When writing my 1905 Annual Report, I took

the trouble to look into the relative value of one, two and three negative results. For that year I found that if one negative result had been relied upon for discharge, the error would have been 24 per cent.; if two negatives 5.3 per cent., that is, in these percentages of cases, the bacilli were found on subsequent examination. My statistics from other districts show that of the cases discharged on a bacteriological examination in 45 per cent. one negative result alone was required; in 39.7 two; and in 15.3 three consecutive negative results.

In the replies to the questions sent to medical officers of health I have been struck by the fact that repeatedly the statement that bacteriological evidence of freedom from bacilli is not obtained is qualified, may I say excused, on the grounds that discharge without it is followed by no return cases? I take it the writers mean no home return cases. If most diphtheria cases were left at home and without any isolation, I believe in many, if not the majority, there would be no other clinical cases in the same family. I have repeatedly found unrecognised cases of several weeks' duration quite unisolated amongst a family of other children and yet remaining the only case. Such facts simply point to the inherent difficulties in the way of infection, and the measure of natural protective forces in our bodies. They surely do not invalidate the potential infectivity of the diphtheria case, and I do not see that they invalidate the potential infectivity of a case discharged with actively virulent bacilli.

The range of infectivity of the discharged diphtheria case with bacilli in throat or nose is indeed much greater, and I think, therefore, of the two he is the more dangerous. The absence of home return cases is not sufficient to show that such a case is harmless.

The prophylactic use of antitoxin is not included in my scheme for the scientific control of diphtheria, because I think its use is most unscientific and unnecessary as a preventive agency. Either the other children harbour diphtheria bacilli or they do not. If they do

not they will not get diphtheria; if they do, the fact that diphtheria bacilli are found will cause a sharp watch to be kept upon them, and antitoxin can be administered on the first onset of symptoms. The injection of antitoxin does nothing to prevent the spread of infection; rather by inducing a sense of security and a selfish knowledge of self protection, it would tend to check proper preventive precautions being adopted. Of course, in country districts, or for special reasons in view of the risk of diphtheria being acquired and symptoms developing before it could be used as a curative, it may be wise to give injections in particular cases. But such instances are really treatment in advance and of purely therapeutic significance; they are in no degree adopted as a means to prevent its spread.

Diphtheria is a disease which is widely prevalent and the cause of much fatality. I believe that the application of really scientific measures to control it would result in a great reduction in its incidence if not its ultimate extinction.

APPENDIX (I.)

SUMMARY AND ANALYSIS OF PREVENTIVE PROCEDURES EMPLOYED IN ENGLAND AND WALES AGAINST DIPHTHERIA.

In the autumn of 1908, I issued a printed circular to the medical officers of health of about 450 of the larger sanitary areas in England and Wales; 304 replies were received. I take this opportunity of thanking the medical officers of health who so kindly supplied me with the asked-for information. The following is a summary and analysis of the replies received. The sanitary areas are classified into four groups:—

- Cities, boroughs, and other urban districts with a population of over 50,000.
- Urban districts with a population below 50,000. The actual populations ranged from 20,000 to 50,000.
- Rural Districts.
- Metropolitan Boroughs.

The actual figures obtained are shown in the following tables I. and II., and the percentage results in table III.

TABLE I.

	A	B	C	D	Total.
Free bacteriological facilities for diagnosis of doubtful cases of diphtheria.					
available	68	113	36	24	241
not available	14	25	24	0	63

TABLE I.—*continued.*

		A	B	C	D	Total.
If bacteriological examination of diphtheria cases performed before discharge from infectious hospital.	yes	42	62	25	...	129
	sometimes	6	3	0	...	9
	no	23	34	17	...	74
	not admitted, no replies, etc.	11	39	18	...	68
The same but for home isolated cases.	yes, if possible	20	26	15	5	68
	sometimes	0	12	0	3	15
	no or not as a rule	50	72	33	2	157
	left to medical attendant no information	6	26	11	9	52
		4	2	1	5	12
In cases bacteriologically examined before discharge, the number of negative results required.	one negative	12	37	10	...	59
	two "	21	22	9	...	52
	three "	13	5	2	...	20
	variable	2	0	0	...	2
If routine bacteriological examination of contacts carried out.	yes	5	8	1	1	15
	to some extent	10	3	5	2	20
	no	67	127	54	21	269
If injections of antitoxin employed as a prophylactic measure.	yes	24	38	23	3	88
	sometimes	14	20	13	4	51
	no or but rarely	43	80	22	13	158
	no reply	1	0	2	4	7

TABLE II.

The average period of detention of diphtheria cases in hospital.

Detention in weeks.	Cases bacteriologically discharged.				Cases clinically discharged (no bacteriological examination).			
	A	B	C	Total.	A	B	C	Total.
2 - 3	0	0	0	0	1	2	0	3
3 - 4	7	11	3	21	7	7	3	17
4 - 5	8	21	4	33	5	16	6	27
5 - 6	12	10	9	31	5	2	3	10
6 - 7	3	6	3	12	2	0	0	2
7 - 9	5	3	2	10	0	1	0	1
				107				60

TABLE III.

The figures of Table I. worked out as percentage results.

		A	B	C	D	Total.
Free bacteriological facilities for diagnosis	available	83	82	60	100	79.3
	not available	17	18	40	0	20.7
Bacteriological examination of cases before discharge from hospital	yes	59	63	59.5	...	60.8
	no, or only sometimes	41	37	40.5	...	39.2
Bacteriological examination of home isolated cases	yes, if possible	28	19	25	26	23.3
	not as a rule, or left to medical attendant	72	81	75	74	76.7

TABLE III.—*continued.*

		A	B	C	D	Total.
Number of negative results required before discharge for the cases bacteriologically examined	one	26	58	48	...	45
	two	46	34	43	...	39.7
	three	28	8	9	...	15.3
If routine bacteriological examination of contacts carried out	yes	6	5.8	1.7	4.2	4.9
	to some extent	12	2.2	8.3	8.3	6.6
	no	82	92	90	87.5	88.5
If injections of antitoxin employed as a prophylactic measure	yes to some extent	47	42	62	35	46.8
	no, or but rarely	53	58	38	65	53.2

The tables speak for themselves, and it is only necessary to briefly comment.

Facilities for free bacteriological diagnosis of doubtful cases are widely available, obtaining in 80 per cent. of the districts, the proportion varying from 100 per cent. in the metropolitan boroughs to 60 per cent. in rural districts. I have no statistical evidence as to how far advantage is taken of these facilities. In rather under two-thirds (60.8 per cent.) of the districts is a measure of bacteriological examination employed before discharge from hospital. The percentages are curiously close for the different groups of areas. Even this measure of bacteriological examination is very incomplete, for of these cases, in 45 per cent., one negative result is considered sufficient; in 40 per cent., two; and only in 15 per cent. are three consecutive negative results required. Considerable differences in procedure are followed in the different areas, the majority of the smaller urban districts, for example, being satisfied with one negative result.

The figures show that bacteriology is very imperfectly employed as a basis for the discharge of hospital cases.

For the cases isolated at home, even this measure of bacteriological protection is not attained, only 23 per cent. of districts bacteriologically examining their cases before being released from isolation; and evidently from the nature of the replies, this only applies to a certain proportion of the cases in such districts.

It is, however, in regard to the use of bacteriology for the routine examination of contacts, that its neglect is most striking. But 11 per cent. do this to any extent and in 6 per cent. this is but partial. This neglect of bacteriology is nearly as marked in the large as in the small urban districts, and in the urban as in the rural areas.

I am not disposed to lay much stress upon the replies in regard to the prophylactic use of antitoxin, since in some instances the replies were not very clear. They show that in nearly half the areas the medical officer of health employed antitoxin in this way.

Table II. is of use, as furnishing evidence of the relative period of detention in hospital. Here many of the replies were rather vague, and too

much emphasis should not be laid upon the figures. Of the bacteriologically discharged cases 20 per cent. were discharged in from three to four weeks, while of those discharged on clinical grounds, 33 per cent. were discharged within this period. Sixty per cent. of the bacteriological group and 62 per cent. of the clinical group were discharged in from four to six weeks. Of the bacteriological group 20 per cent. were discharged in from six to nine weeks, and only 5 per cent. of the clinical group.

These figures show that the detention was somewhat longer for the bacteriologically discharged cases, roughly 15 per cent. being kept an additional three to four weeks. Evidently a considerable proportion of the cases discharged on a clinical basis, were sent out with living diphtheria bacilli in their throats.

APPENDIX (2.)

NOTE ON THE POSSIBILITIES OF HASTENING THE DISAPPEARANCE OF DIPHTHERIA BACILLI.

It is a matter of much practical importance if the bacilli found to be present upon the throats of diphtheria contacts and cases could be readily eliminated, or at least their disappearance accelerated.

I have made extensive experiments in this direction with the use of different antiseptics, etc., but with no conspicuous benefit. I have not been able to satisfy myself that their use has hastened the disappearance of the bacilli; in fact, I frequently prefer, for hospital isolated cases, to use a simple gargle of sodium bicarbonate and potassium chlorate. Antitoxin injections are useless. Possibly the use of harmless living bacteria might be of more utility, and I would suggest the use of yeast cultures, and perhaps lactic acid bacilli, but I have not yet had the opportunity of trying these organisms.

In the case recorded below, removal of the tonsils was very satisfactory. The details of this case have not been previously published, and are briefly as follows:—

D.B., female, age eight years, admitted to hospital with diphtheria, July 9th, 1906. Straight-forward case, but with persistent bacilli.

Oct. 6th (89 days after admission). Bacilli still present, and both tonsils large and with deep crypts. As much as possible of both tonsils removed with guillotine.

Oct. 8th. The child had no temperature or symptoms, but a thin white friable membrane on both sides over the parts of the tonsils left behind. Swab showed typical diphtheria bacilli. Oct. 15, 17, 19, no diphtheria bacilli, patient discharged.

The tonsils on removal were placed in a sterile bottle, removed to the laboratory and examined the same day. Cultivations upon blood serum were made from two separate crypts, a sterile platinum loop being passed down to the base of the crypt, contamination from the surface being prevented by previously searing the surface of the tonsil with a hot iron. From the one crypt diphtheria bacilli grew fairly abundantly, but they could not be identified with certainty from the other crypt. Sections were also made from one tonsil after fixing and hardening. On staining by Eosin Gram Weigert method, diphtheria bacilli could be demonstrated both on the surface of the crypt and also slightly away from the surface, amongst the lymphoid tissues. These bacteriological findings explain the comparative futility of antiseptic treatment to eliminate the bacilli.

Discussion.—Dr. EDWARD SEATON (Surrey), expressed his admiration at the lucid and forcible manner in which Dr. Savage had presented his arguments. They were worthy of such an expert administrator and bacteriologist, but, from a preventive point of view, so far they had not been able to make out a very strong case for isolation in regard to scarlet fever and diphtheria. Dr. Seaton quoted statistics relating to Surrey in support of this view, and considered that the period covered by Dr. Savage's experiments was too short to enable them to be taken as definite. He suggested that other towns of the same size as Colchester should be induced to co-operate with Dr. Savage over a longer period, when they might be able to present some arguments that would weigh with administrators.

Dr. A. GRIFFITH (Hove), differed from Dr. Seaton, his experience in the small borough of Hove coinciding with the deductions of Dr. Savage. He differed, however, from Dr. Savage in his views on anti-toxin as a prophylactic.

Dr. E. H. SNELL (Coventry), thought that if Dr. Seaton's suggestions were carried out they would find that there would be considerable advantage in adopting the suggestions of Dr. Savage.

Dr. R. A. LISTER (Hampshire), said that he would like to know the grounds for Dr. Savage's statements in regard to the use of anti-toxin. The results obtained by himself were exactly the opposite of Dr. Savage's experience.

Dr. J. HOWARD JONES (Newport, Mon.) commented upon the difficulty of arriving at a satisfactory conclusion as to the presence of the diphtheria bacilli in 24 hours, which in ordinary routine work was the time allowed for the report.

Dr. E. H. T. NASH (Derby) described the system adopted in his district, and dwelt upon the importance of school notification from the teachers.

Dr. ELLIOTT ROBINSON (Dorchester) differed from Dr. Savage in regard to his statement that diphtheria was not due to insanitary conditions. They knew that the horse could have diphtheria, and he could see no reason why the manure and effluvium from the stable should not convey it to a person's throat or nose. In his district market gardening was undertaken, which necessitated the use of large quantities of manure, and diphtheria was also very prevalent in the district.

Dr. S. C. LAWRENCE (Edmonton) declined to accept the statement that diphtheria was only acquired from a previous case and could not be acquired from insanitary conditions.

Dr. J. S. TEW (Tonbridge) said that the great difficulty in regard to Dr. Savage's system was the question of expense.

Dr. E. W. GOODALL thought that Dr. Seaton had misunderstood Dr. Savage. The latter had been somewhat disappointed in isolation and wished to push prophylactic measures further. The chief difficulty was the question of expense.

Dr. P. CALDWELL SMITH (Wandsworth), said that it would be a practical impossibility to carry out in a metropolitan area such a system as that advocated by Dr. Savage, nor did he consider it necessary in view of the experiment now being carried out in Wandsworth, which he explained.

Dr. HERBERT JONES (Herefordshire C.S.D.) thought that Dr. Savage had not taken sufficient notice of the importance of school contacts.

Dr. EDWARD SERGEANT (President) said that they were all very much indebted to Dr. Savage for his paper which had been productive of a very interesting discussion. He did not think that Dr. Savage really intended to cover the whole subject matter of diphtheria in one evening. He had dealt with the importance of carrier cases and what should be done to prevent the disease from being spread. It did not, of course, prevent paying attention to the other means of preventing the spread of the disease. They must not forget that they had many cases in many towns, and that they had to supervise and advise in every possible way in the carrying out of the ordinary duties of the sanitary inspector.

Dr. SAVAGE, in reply, said that most of the remarks were directed, not so much against anything he had said, but were in reference to his omissions and the relative importance of other factors. Stress had been laid by several speakers upon the importance of the general sanitary factor and the possible association with animal disease. In regard to the former, he did not wish to undervalue the importance of sanitary surroundings, but as regards this disease, they were surely of secondary significance. He was convinced that diphtheria was a personal disease spread by personal contact from case to case. Improved sanitary surroundings might enable individuals to become carriers instead of falling ill themselves, but that would rather tend to spread the disease in the end instead of diminishing it, just as mild scarlet fever outbreaks often ultimately involved more cases than those of more toxic type. He could not acquiesce in the conclusion that any marked spread of diphtheria was due to the

DIPHTHERIA.*

By ANDREW SMITH, M.D.,
Medical Officer of Health, Whickham.

MY interest in diphtheria goes back to forty years ago, when I suffered from it as a schoolboy, just old enough to be deeply interested in my own case.

I can never forget the utter exhaustion and prostration which came on almost suddenly on the evening of the first day of illness, after I had tried to conceal it and kept going about. And yet the attack proved to be comparatively mild, mildness itself when compared with that of my younger brother, who was then convalescing from what had been considered a hopeless attack.

We were treated vigorously with local applications, gargles and inhalations, and both recovered completely and without subsequent paralysis.

This fact gave great encouragement at the commencement of practice, and the fact that no other cases occurred in the neighbourhood immediately before or after did not suggest great infectiveness, as but few precautions were taken.

The first cases met with in practice formed a striking contrast. A severe case of faucial diphtheria was treated most vigorously by local applications of carbolic acid and iron every two hours for many days, the applications being mostly made personally; iron and chlorate of potass were given internally, and, with careful feeding and free use of stimulants, convalescence became established. Subsequently, paralysis came on, at first of the soft palate, but it gradually extended to the limbs and trunk, until it caused death by extension to the respiratory muscles.

In the meantime, attention was drawn one day to a young child in the same family who had become prostrated. Examination disclosed that the fauces, nose, anus, and vagina—almost all the visible mucous surfaces—were covered with diphtheritic membrane. Of course, the child died of profound toxæmia.

Fortunately, such severe cases are quite exceptional, but it is none the less true that, do as we liked, we found many cases die of sheer toxæmia, in spite of all treatment carried out most assiduously; and though the cases of

lower animals. Veterinary authorities declare that equine diphtheria is of the rarest occurrence, and only one definitely proved case was, he believed, known. That cats suffer from diphtheria seems to be a popular idea, but there is very little scientific evidence in its favour. The few cats examined by the writer (swabbings or post-mortem) always showed negative results. Birds suffer from avian diphtheria, but he believed he was correct in saying that this disease is quite distinct from human diphtheria, and not due to the Klebs Löffler bacillus. It must be remembered that bacilli, morphologically very like diphtheria bacillus, are fairly common, and mere evidence of morphological similarity is quite insufficient for proof of any etiological relationship. The main argument of his paper had really been but little assailed, i.e., that the disease is spread by infected contacts, themselves not ill. It has been completely proved that diphtheria bacilli occur in such cases, yet (excepting Dr. Caldwell-Smith) those who objected to their isolation had not advanced a single argument in proof that they do not spread the disease. The crucial point remained, either these cases spread the disease or they do not. If the latter, let us have evidence of their harmlessness; if the former, he would repeat, it was hopelessly illogical and unscientific to isolate the case and let these persons go free to infect wherever they can. It was not possible to criticise Dr. Caldwell-Smith's experiences without more extended study of all the facts. It is obvious that the question must be elaborately studied and not merely judged by the negative evidence of absence of notified cases. Dr. Savage remarked that the severest criticisms had been levelled against the statement that the prophylactic use of antitoxin was unscientific as a preventative agency, and that it was useless to clear off the bacilli in the throats of infected cases. Nothing that had been said had made him wish to alter that statement. Its use did not prevent infection with the bacilli. As a procedure to forestall symptoms of the disease, it may have a wider utility than he was inclined to yield to it, but its usage in no way prevented the dissemination of the bacilli. It was, he believed, quite impracticable to inject all contacts with antitoxin as a routine measure. He stated that antitoxin injections were useless to remove bacilli, as the results of his own experience, the recorded experience of others, and upon theoretical grounds. Antitoxin neutralises the toxins formed by the diphtheria bacillus. The antitoxin is not inimical to the bacillus itself, but to its toxins, nor, as far as he was aware, does it stimulate the cells of the body to produce substances antagonistic to the bacillus. On what grounds, then, should antitoxin help to remove the bacilli? The suggestion that statistics should be prepared to show the incidence of the disease in the districts which examined contacts bacteriologically, as contrasted with those that did not, was valuable, but there were obvious difficulties, while many of these cases in the more bacteriologically protected districts were infected from contacts and cases from the districts in which contacts were ignored.

* Presidential Address to the Northern Branch of the Society of Medical Officers of Health, on October 23rd, 1908.

such extensive paralysis as that related are very exceptional, it is by no means uncommon to get fatalities from heart failure during convalescence, either quite suddenly or more slowly: partly from degenerative changes in the heart muscle itself, with cardiac dilatation, or from cardiac paralysis due to degenerative changes in the nerve cells. Such cases have, in my experience, been very rare, for the reason, as I believe, that I have insisted on all cases of diphtheria, however mild, being kept in bed for a fortnight after convalescence was established, and only afterwards allowed the mildest exercise for a month. At the present day, with anti-toxin treatment, I still, as far as I am able, insist on this.

On the whole, during at least twenty-five years' experience before the introduction of anti-toxin, we got very good results from this thorough local treatment by antiseptics, iron and chlorate of potass internally, good feeding and stimulants. I did not allow sleep to interfere with the local treatment, because it was found that at the height of the disease if the local treatment was missed for a few hours the membrane invariably spread. The patients were therefore roused up at the regular times, had their throats brushed, and medicine, food and stimulants given. When this treatment was commenced early enough in purely faucial cases, it was but very rarely that laryngeal symptoms developed.

I have the liberty of drawing on my brother's experience as well as my own, for we always kept in touch with each other in the management of diphtheria, and I saw some of his worst cases in the severe local epidemics which occurred in his practice.

By good results I mean that, apart from laryngeal cases, our mortality was not more than 20 or 25 per cent., and, as I have said, we but seldom got laryngeal symptoms if we got the cases under treatment before laryngeal symptoms occurred.

In pure laryngeal cases, however—the cases of so-called membranous croup—the matter was very different. Here local treatment could not be applied, and these cases almost invariably died. Whenever we found at the first visit a child with croupy symptoms, *i.e.*, harsh breathing, ringing metallic cough, some dyspnoea, retraction of the episternal notch and intercostal spaces, and even without these latter, with membranous patches on the tonsils or any other part of the fauces,

indicating membranous croup or laryngeal diphtheria, the patient almost invariably died from suffocation, in spite of all treatment, for the operation of tracheotomy, so comparatively successful in hospitals, helped us very little in colliery country practice, where efficient nursing could not be obtained.

I had only one recovery from true laryngeal diphtheria before the days of anti-toxin.

In a paper read before the Newcastle-on-Tyne Clinical Society, in November 1889, my brother, Dr. Smith, of Ryton, stated that out of a very considerable experience he had not had a single recovery; and this is in accordance with the extensive experience of Trousseau, who had only known six cases recover without tracheotomy.

Taking all varieties of the disease, we were fortunate indeed if we got, in a large series of cases over many years, a mortality of much under 50 per cent., and to get it much under 40 per cent. we had to use the most persistent local treatment, continued over many days, which was a severe ordeal for our patients, generally young children.

Thanks to the investigations of the bacteriologists, our position regarding diphtheria has been enormously improved. We have now not only a very complete knowledge of the disease, but we have had placed in our hands a remedy which may be truly described as an antidote or specific cure—the diphtheria anti-toxin.

Stated briefly, diphtheria is a disease due to a specific organism—the Klebs Löffler bacillus. The growth of this on the mucous membrane of the respiratory passages produces a toxin which, being absorbed into the blood, causes the symptoms of the disease. When death results, it is usually due to pure toxæmia; but in laryngeal cases it is due to suffocation owing to the specific pseudo-membrane blocking the larynx, for in these cases death results before the toxæmia is itself sufficient to cause it. If death from toxæmia or suffocation be averted, further and later symptoms occur from organic changes of a degenerative character in the tissues, especially the nerve cells, which result in paralysis of a characteristic type. This may cause death from progressive paralysis ultimately affecting the respiratory muscles or more usually from heart failure.

Anti-toxin acts by neutralising the toxin thereby aborting the disease. It has no effect

on the toxin which has already been absorbed and become firmly attached to the nerve cells. As this happens within half an hour of the absorption of the toxin, we may say that anti-toxin has no effect in neutralising any toxin which has been absorbed for more than half an hour, but it will at once neutralise any that may be absorbed subsequent to its administration.

No matter how large a dose is given it cannot do more than this. It is therefore rather preventive of further damage than curative of the damage already done.

If a lethal dose has already been absorbed, anti-toxin can do no good, death will still result. But if a lethal dose has not yet been absorbed, anti-toxin will effect a cure by preventing all further toxic effects, while the natural curative powers with what further aid we can confer will restore the injury already effected.

If, however, the amount of toxin already absorbed, though not sufficient to cause immediate death by toxæmia, is still such as would cause that degree of degeneration of nerve cells, as would result in paralysis, it is equally clear that no amount of anti-toxin can avert this result.

No matter how large a dose is administered, the paralysis will follow.

When we realise what a unit of anti-toxin means, and when we further realise that it cannot neutralise any toxin already absorbed and fixed, but can only abort the disease at the stage at which it is administered and prevent further toxæmia, it would seem that no very heroic dose should be necessary.

Such is the teaching of the experimental bacteriologists, and when this is tested by clinical experience it is found to be absolutely true.

Immediately after being appointed medical officer of health for the Whickham Urban District, the Council on my advice decided to supply anti-toxin gratuitously, and all doctors practising in the district were duly notified of the fact with a strong representation of its value. Since then it has been very generally though not invariably used. One still hears expressions of doubt as to its utility, and there is still a tendency to defer its administration until other means have been tried, which is surely a very great mistake. Used in this way as a last resort, when death is already imminent, it is not of the slightest value either

in toxæmic or laryngeal cases; hence where it has only been thus used one can understand the scepticism as to its value.

During the four-and-a-half years of which I have the records, there have been notified 120 cases with 12 deaths, which gives a case mortality of exactly 10 per cent.

This is a great improvement on the 40 or 50 per cent. mortality prior to the introduction of anti-toxin, but it does not give at all an adequate expression of the value of the remedy, for it takes no account of the rapidity of recovery nor of the great relief of suffering so quickly given and the non necessity of severe local measures, and on analysing and enquiring into the deaths it was found that in several cases anti-toxin was not used at all, and in others it was only used when too late to be of any benefit: at least nine of the twelve were either essentially laryngeal cases or they had laryngeal symptoms before anti-toxin was used. In some returned as membranous croup, the diphtheritic nature of the disease was scarcely recognised, and I am not prepared to say that they must all have been diphtheritic; for although I believe it is a safe rule to regard all cases of laryngitis with marked obstruction as most probably diphtheritic, and as consequently indicating the use of anti-toxin, there are good grounds for believing that fatal laryngitis, even fatal membranous laryngitis, may occur independently of diphtheria and these will not be favourably influenced by anti-toxin. One case I know had been ill a whole week, and laryngeal symptoms had existed two days before anti-toxin was given, and it is not surprising that death resulted a few hours later. In two of my own cases laryngeal obstruction was so severe when first seen that I only gave anti-toxin as a chance, but with little hope of success as tracheotomy was declined.

In another case of my own, symptoms had existed for a week before I saw it, the parents having hitherto trusted to repeated blowing of sulphur into the throat. The fauces, pharynx, and soft palate were thickly covered with membrane, and the whole throat looked gangrenous, and the fetid odour of the breath made the room sickening. The child was dying of toxic poisoning from malignant diphtheria; though I gave anti-toxin as a routine, it was without any hope, and the child died the same night.

In striking contrast was the sister of this child, who took ill during the night a few days later. When I saw it in the morning the tonsils, uvula, and soft palate were already covered with membrane. A dose of anti-toxin of 2,000 units was at once injected, the further progress of the disease was arrested, and in forty-eight hours every trace of membrane had disappeared and the child was convalescent, and no paralysis followed.

This is my almost invariable experience in faucial diphtheria. With the above exception, I have not during these years had a death from immediate toxæmia, nor from laryngeal obstruction where the larynx was not already invaded when first seen.

I make it a rule never to go a driving round without a sterile swab and a few doses of anti-toxin in my bag. In every case of diphtheria, or where the condition is strongly suggestive of diphtheria, I take a swab and at the same time give 2,000 units of anti-toxin, and invariably by the time I get a report, which in these cases is nearly always positive, the patient is convalescent. I scarcely ever give a second dose, and I do not believe it is ever necessary.

In laryngeal cases the position is somewhat different. If the symptoms are still mild, indicating only slight obstruction, the result is equally satisfactory, as the disease is quickly arrested; but if there are indications of severe obstruction, and this has come on quickly, then, by virtue of the very efficacy of the treatment, the symptoms are liable to be aggravated and the immediate danger increased, because as the membrane loosens in bulk it only further obstructs the breathing, and as the most violent inspiratory efforts are being made, the mass of membrane is liable to be sucked into the trachea and bronchi. I have in some cases met this with success by having an emetic dose of Vin. Ipecac. ready to be given whenever the obstructive symptoms become markedly aggravated, as the immediate act of vomiting forces up the loosened membrane. In most of such cases, however, I firmly believe that tracheotomy is indicated and should be performed. With anti-toxin already administered, the operation, unless too long deferred, adds but little to the danger, at least, if skilled nursing can be procured. In country and colliery districts this ought to be considered indispensable.

At the same time, I have during the last

two years seen a considerable number of laryngeal cases, some of them very severe, in which by the immediate use of anti-toxin, the steam kettle, and Vin. Ipecac. used as above stated, all but one have recovered without tracheotomy. The fatal case was a child aged three years, who took ill during the night with symptoms of croup; was seen in the morning, when anti-toxin was given, and arrangements made for tracheotomy, but when this was performed within two hours by an expert operating surgeon, the child was already in *extremis* and it never rallied. Such a rapidly fatal case as this baffles all treatment. Fortunately such cases are rare.

We may say with perfect confidence that the essential, the only real treatment of diphtheria, is anti-toxin.

When administered properly and sufficiently early it is in all but a very few cases, certain, speedy and complete, all other treatment is but supplementary. When administered early enough, one dose of 2,000 units is nearly always sufficient. In late cases I have sometimes given more—up to 6,000 units—but I honestly believe that these larger doses were unnecessary, and certainly no results could be better in the great majority of cases which I have treated than that obtained by a single dose of 2,000 units.

How anyone who has had experience of diphtheria in the days before anti-toxin was introduced, and who has watched the progress of cases since, when this remedy has been systematically used, can for a moment hesitate to use it, or can even reconcile it with his conscience to postpone its use for even an hour, is what I cannot understand.

It never does any real harm; it is true that in a certain proportion of cases, joint pains, generally of a trifling character, result from the serum, and in about 5 per cent. of the cases an irritable erythema or urticaria results from the same cause ten days or a fortnight after its use, but they soon pass off, and surely this is only a small price to pay for the speedy and effectual cure of such a malignant disease.

An idea has become somewhat prevalent that it increases the tendency to paralysis, but this is a pure delusion without a scrap of evidence to support it.

It is quite true that some statistics have shown an increased number of cases of diphtheritic paralysis since anti-toxin was

used, but that is only because so many more cases have recovered, and we know that the remedy has no effect on the toxin which had already been absorbed prior to its use. It is that previously absorbed toxin which causes the paralysis, and, therefore, the way to prevent paralysis is to use anti-toxin early.

In my experience paralysis very rarely occurs when anti-toxin has been used on the first or second day, but it is common enough when its use has been deferred just as it was in former days when anti-toxin was unknown. Anti-toxin has never caused paralysis in laboratory experimental animals, and the horses used for its production, and whose blood becomes saturated with it, never develop paralysis.

At first the expense of anti-toxin rather militated against its use when very large doses were considered necessary; but if my experience with the smaller doses given early is at all in accordance with that of others, this no longer holds, for that dose only costs 2s. 6d., considerably less than what in former days was spent on brandy and other alcoholic stimulants which are now but seldom required.

Besides, the most liberal and advanced councils now supply the remedy gratuitously, and in doing this they act with the truest economy, not only in the saving of life and suffering by encouraging its use at the earliest moment, but the initial cost is saved many times over in lessened hospital expenditure.

LOCAL TREATMENT.

With the use of anti-toxin, local treatment to the throat has, in my opinion, become quite unnecessary. Where the patient is old enough and is not nervous, mild sprays, gargles, or the local application of mild antiseptics may be helpful, and may be found soothing; but when, as is most frequently the case, the patients are young nervous children, I am confident that they do more harm than good. They interfere with the all-essential rest, and cause a degree of unnecessary excitement which may even be dangerous when the heart is showing signs of failing. I make this statement in spite of the fact that in former days we got excellent results from persistent local treatment, and indeed almost wholly relied on it.

Whether the frequent application of power-

ful antiseptics to the throat diminishes, to an appreciable extent, the infectiveness may be more open to question.

It is quite certain that we cannot destroy all the bacilli by this means; we can only deal with a small area leaving a much larger one where the bacilli still lurk quite unaffected. But as it is necessary to isolate the patient for a prolonged period in any case, I do not believe that such local applications do any good at all, certainly nothing in comparison to the suffering and shock which they cause to the majority of our little nervous patients.

In laryngeal cases I still use the steam kettle charged with a little sanitas.

It is much the same with drugs. I generally give an iron mixture with chlorate of potash or liq. ammoniæ acetatis at the beginning, and iron and strychnine or nux vomica during convalescence, and I believe they do good, though in average cases treated early by anti-toxin they are probably not essential. With regard to the first especially, no great importance can be attached to it in genuine cases, but as it is most valuable in septic throats which the most resemble diphtheria, it is generally worth giving. In true cases aborted early by anti-toxin before there has been much toxic absorption, convalescence is generally uninterrupted; but in later cases iron and strychnine are most valuable in convalescence and may almost be regarded as necessary where there has been much toxic absorption. Each case must, however, from day to day be treated individually. It is not so much the specific disease as the patient who requires drug treatment, so that the general condition must receive the utmost attention, especially the heart and nervous system. Here the great guide is the condition of the pulse; wherever there is irregularity, low tension, excessive quickness or undue slowness, there is indicated the need of strychnine, as there is also when other symptoms of paralysis manifest themselves. Full nourishment throughout is essential, taking care to give only what is easily digested and absorbed, which does not overload the stomach, produce flatulent distention and throw too much work on the kidneys.

As regards stimulants, in former days we found it necessary to give them very freely; now-a-days it is but seldom that I prescribe them at all. Again, the pulse and general condition are the guides. My younger brother,

only aged seven years, took for a week on an average two bottles of port wine in three days, and one day he had a whole bottle without any apparent intoxicating effect. I was not considered ill enough to get any. These facts show to me that the old country practitioner, for he was an old man who attended us, was a very wise and careful practitioner.

ANTI-TOXIN AS A PROPHYLACTIC.

Should anti-toxin be used as a prophylactic? In my opinion this is seldom necessary or advisable. Though it is common enough for one or more members of a family to contract the disease after the occurrence of one case, this cannot be said to be the rule. Unquestionably a prophylactic dose would effectually protect all those others for three weeks or so, but, after all, only a small proportion would develop the disease without this prophylactic, especially if the first case was promptly isolated, as we all agree is necessary. But it would not prevent contacts becoming "carriers," because we know that the insusceptible, whether immune naturally or artificially, can harbour the bacilli in their respiratory passages and so convey infection to others.

It would, therefore, be no gain to public health, and a certain proportion of those who get the prophylactic dose would have the disagreeable effects in urticaria, erythema, and arthritic pains. On the other hand, if they or the parents are cautioned to be on the alert, on the earliest symptoms of the disease occurring, a curative dose can be given with the certainty of at once arresting the disease, and this surely ought to be sufficient.

The only case in which I think a prophylactic dose is advisable, is where a patient has been admitted to the diphtheria ward of an infectious disease hospital on a wrong diagnosis. Here he is exposed to an unnecessary risk which a prophylactic dose of anti-toxin would at once remove and he might be discharged at once.

With the treatment of diphtheria by the early administration of anti-toxin, I feel confident that the mortality may be reduced almost to the vanishing point, especially if the public can be taught to seek medical advice early in all cases of sore throat, and especially on the occurrence of croupy symptoms. The mortality ought to be reduced considerably below that of the hospitals where the cases are too often only sent in a late stage of the disease,

and often—by far too often—without the previous administration of anti-toxin.

Excellent as are the provisions made for notification and subsequent removal to hospital, and for bacteriological examination by an expert, they have serious disadvantages, inasmuch as they discourage immediate treatment by the general practitioner. Of this fact I have abundant evidence.

To defer administering anti-toxin in a reasonably suspicious case is wrong. It is wrong to trust to its administration in hospital and it is wrong to wait for bacteriological confirmation, for in country districts each of these delays means a loss of two days.

I do not think that even in early and mild cases the clinical diagnosis is nearly so difficult as is generally stated and, valuable as the bacteriological confirmation is, my personal experience has been that for practical purposes the bacteriological diagnosis has been more at fault than the clinical. On the latter I have always acted.

An amount of dogmatism is here quite justifiable. Whenever a case is doubtful a swab should be taken and examined; but whenever there is a reasonable suspicion of diphtheria anti-toxin should be given at once; and if the case cannot be properly isolated at home, hospital isolation should be advised and urged.

The general practitioner should not hesitate to risk a wrong diagnosis in the interest of his patient, but he should at once communicate the bacteriological report to the hospital physician. If the report be positive, he will already have cured his patient, if negative he will have saved him from all risk of infection in the diphtheria ward.

The hospital physician should then have another swab examined, and if still negative he can safely discharge the patient.

In a case like this where every hour counts, as it most certainly does, it is infinitely better to give an occasional unnecessary dose of anti-toxin, than to jeopardise life by delay, for it is doubtful if the remedy has any effect after the fifth day.

The importance and urgency of the case would seem to justify a special representation from the county medical officers of health to all doctors practising within their respective counties.

It is also imperative that, as in the large isolation hospitals of the towns, the doctor

for the country hospitals should make provision for the immediate performance of tracheotomy whenever required.

I have not been able to discover any evidence in favour of the contention of some sceptics of the anti-toxin treatment that the diphtheria of to-day is of a less malignant type than that of the past. We certainly see fewer very malignant cases, but that is because by the early use of anti-toxin we prevent the most malignant symptoms developing. Where this remedy has not been used early, we still get the old malignant type, and I have seen numerous cases of extreme severity of only two or three days duration immediately arrested by a single dose of 2,000 units.

I have seen more cases of pharyngo-laryngeal diphtheria during the last two years than ever I saw before in the same time, and all have recovered under anti-toxin without tracheotomy, while in the old days practically all such cases died.

I do not therefore believe that there has been any lowering of the virility of the infection. The improvement has alone been due to anti-toxin, as have also been the greatly improved hospital statistics.

Where in private practice this remedy has not been generally and early used, the case mortality has remained high; where it has been systematically used the mortality has been greatly lowered. The evidence of Dr. Taylor, in his annual report for 1906, is most valuable on this matter. In a large area with many townships, the case mortality was proportional to the supply of anti-toxin; where it was largely used the mortality was low; where scarcely or not at all it was as high as in the old days. I do not agree with what Dr. Taylor says in that report with regard to dosage, for he recommends large and repeated doses; but I most thoroughly agree as to the necessity of its early administration. It is not so much the size of the dose (within certain limits, of course) as the earliness of its administration which is the essential matter.

PREVENTION OF DIPHTHERIA.

When considering the prevention of diphtheria we must be guided entirely by the knowledge we possess as to its origin and mode of spread.

The only facts clearly proved are direct and indirect infection, direct from patient to patient, indirect through intermediate carriers who, though not themselves ill, harbour the

bacilli in their respiratory passages and infection through drinking vessels, milk, etc., contaminated by patients, convalescents and contact-carriers.

All other alleged methods of origin must now be regarded as doubtful and unproved, such as general and special insanitary conditions, defective and obstructed drains, cesspools, manure heaps close to dwellings, damp and mouldy walls in dwelling-houses, recent disturbance of soil as occurs when new houses are built, etc. At the same time, I am not prepared to admit that these various conditions play no part in causation.

The immense amount of evidence accumulated in favour of the association of diphtheria with such conditions should not be lightly ignored. I am sure we have all seen—I certainly have seen—numerous cases in which this association was present, and where it was impossible to prove direct infection.

We all may admit that these conditions do not originate diphtheria, and yet believe that they in some way favour the development of the disease when the bacilli are otherwise introduced.

I am not satisfied that the mere lowering of vitality caused by these conditions is a sufficient explanation of the association; there is something specific and definite about it that we do not yet understand.

It is true that all this evidence suffers from lack of mathematical precision, but that cannot be said of the investigations of Newsholme on the endemic and epidemic prevalence in different countries, on the comparative incidence in rural and urban areas, on seasonal prevalence, on influence of soil and climate, and on the incidence of the disease compared with rainfall and level of ground water, for these investigations have been conducted with mathematical precision throughout.

It seems to me to be quite certain that in diphtheria and in all the other infectious diseases, it is not enough to know the specific bacillus which causes the disease, to know its life history and how it affects the body; there are other factors almost equally important in the body itself which cause varying degrees of susceptibility and which modify the action of the bacilli and their toxins; hosts of conditions of which we are still ignorant, and which will only be fully elucidated by the association of mathematics with observation, experiment and induction.

There are at the one extreme the significant investigations of Hamilton, on braxy and louping ill in sheep, showing the extraordinary seasonal influence as regards susceptibility and immunity while the bacillary culture remains the same; then in diphtheria, and perhaps pneumonia and tuberculosis, the very variable susceptibility both in individuals at any time and the same individuals at different times going on to such diseases as small-pox and measles, where apparently everyone is susceptible at all times until one attack has been gone through, and even then there is still apparently a seasonal prevalence.

As regards alleged infection from a similar disease in domestic animals, such as cats and fowls kept in backyards, I think we may say that this also is unproven; but until many more investigations have been made into the alleged diphtheria of animals, we cannot say that it is altogether disproved.

As medical officers of health, I am sure we only act wisely when we enquire into all these possibilities and insist on all insanitary defects being remedied, and when we make the occurrence of an outbreak of diphtheria the occasion of effecting sanitary reforms.

After that we must face the essential problem of dealing with infection by direct and indirect contact.

The facts are, first, infection from the patient, not only during the attack, but for an indefinite and prolonged period afterwards. Second, probable infection by all contacts, also for a prolonged period.

Third, the only proof of infectiveness is the culture of diphtheria bacilli from swabs taken from the throat and other respiratory passages.

Whenever a swab taken from the throat gives a positive result, the person from whom it is taken is an infective subject and a danger to the community, and he should accordingly be isolated.

The logical outcome of this is that all diphtheria patients should be isolated until repeated swabs are proved negative, and that all contacts should be similarly examined and isolated so long as swabs from their throats give a positive result.

So, also, when the medium of infection is clearly or even probably a school, all the children, or at least those in the probably infected class-room should be similarly dealt with.

All this would, however, involve an intolerable interference with personal liberty, and there would still be the difficulty of deciding upon who should carry it out.

Browning's Bishop Blougram gives expression to excellent wisdom in words which are very applicable to the problem we are discussing. He says:—

"The common problem, yours, mine, everyone's,
Is—not to fancy what were fair in life
Provided it could be—, but, finding first
What may be, then find how to make it fair
Up to our means: a very different thing!"

Truly a very different thing; we have got to realise how far we can safely go, and then determine how we can best act within that limit.

It seems to me that the best and simplest method would be to concentrate attention on the children, and act through the education authority by getting the following rules enacted: First, no child notified as suffering from diphtheria will be re-admitted to school until a certificate is received that a bacteriological examination has been made and found negative.

Second, that all other children in the infected house (even if the patient has been removed to hospital) shall be excluded until they can produce a similar certificate.

Third, where there is good reason to believe that a school is the centre of infection of a group or groups of cases, it may become necessary to undertake a thorough examination of the school or of one or more class-rooms where these seem to be the centres affected; and for this, co-operation between the education authority and the sanitary authority would be advisable. It could be arranged between the school medical inspector and district medical officer of health, with the assistance, if necessary, of the county medical officer of health. As the alternative to this would be school closure for a prolonged period, which is always objectionable and to be avoided unless absolutely necessary, I do not think that any serious objections would ever arise.

Fourth, bearing in mind the possibility of infection through drinking vessels, I think it may also be impressed on all school authorities that the utmost cleanliness and nicety of manners in the use of drinking vessels and in other ways should be enforced at school. This in any case would always be a valuable lesson in domestic hygiene.

DRAINS AND DIPHTHERIA.*

By A. E. THOMAS, B.A., M.B., D.P.H.,
Medical Officer of Health, Chester.

THE popular association of diphtheria with defective drainage is of time-honoured, almost paleolithic antiquity, revered alike in the creed of the man on the kerb-stone, the sapient law-giver, and the writer of standard text books.

It might assuredly date from the time of the caveman, when any mishap, which could not reasonably be assigned to the unauthorised use of an illicit flint was attributed to dire omens, to drains, or perhaps, the lack of drains.

Of its truth, until recent times, all appeared to be convinced; few there were who desired evidence or confirmation of the proof. For, in sooth, some one had said it: that ended the matter.

And the belief that these two factors stand in relation of cause and effect, forms the basis of so many actions at law that, in these days of doubt and apprehension, it becomes necessary once more to review the evidence connecting them and the opinions concerning them.

With the discovery of the specific bacillus, this popular, banal and presumably causal association, derived from preconceived and airy impressions has tended to sink into the background, and the opinions now expressed are far less dogmatic and assertive than in former days.

Thus:—

"*Drainage Effluvia*.—Diphtheria is more severe and more prevalent among persons exposed to foul gases from sewers or drains. The relation is, however, by no means direct. Houses with the worst forms of drainage defects may remain free from diphtheria for indefinite periods, and many cases of diphtheria occur in premises in which no defect can be found. The same may be said of other insanitary conditions, notably dampness of house, accumulations of manure and other filth in proximity to houses. All these ought probably to be regarded as predisposing causes only."—*Whitelegge and Newman, 1905, p. 364.*

"It has been a matter of observation that certain rural districts in which the surface soil is cold and humid, and where damp houses and privy and drainage nuisances abound . . . are particularly favoured by diphtheria."

"Faulty sanitary surroundings (drainage and filth nuisances) tend to the production of diphtheria

In this way, it seems to me, most of the difficulties would be overcome. It will be noted that by the first two rules the onus of proving freedom of infection would be placed on the parents, who would naturally call in their own doctor and remunerate him in the usual way. In colliery contract practice the practitioner might feel aggrieved, but he would be more than compensated by the decreased number of cases he would have to attend, the lessened period of attention to each where anti-toxin is used, and the saving in cost of anti-toxin where that is given gratuitously by the district councils.

In the further regulations concerning the schools, the duty is only a part of what ought to be involved in medical inspection in association with sanitary administration.

The probabilities of the adult members of a household, where an attack has occurred, communicating the disease as carriers are so slight that for all practical purposes they may be ignored. The risk is slight in comparison to the grievance which would be caused by isolation and prohibition of work.

Unless it be true that the diphtheria organism has a preliminary and saprophytic existence in the soil, as is confidently alleged by some, but of which there is as yet no proof, it seems to me that by an energetic use of those means which I have briefly sketched, the incidence of diphtheria may be almost reduced to vanishing point, and by the early use of anti-toxin in comparatively small doses in the remaining occasional cases the mortality might almost cease, so that this dread disease may, in the immediate future, in this country at least, become like cholera and typhus fever, only of historic interest, a consummation devoutly to be wished.

MIDWIVES ACT COMMITTEE.—The fourth meeting of the departmental committee appointed by the Lord President of the Council to consider the working of the Midwives Act was held on February 17th at the Privy Council Office, Mr. Almeric W. FitzRoy presiding. The following witnesses attended and gave evidence: Miss Wilson, President of the Incorporated Midwives Institute; Mr. F. B. Harris, Deputy Town Clerk of Nottingham, on behalf of the Association of Municipal Corporations; Mr. Joseph Brown, of Dewsbury, on behalf of the Association of Poor Law Unions in England and Wales; and Mrs. Wallace Bruce, on behalf of the Association for Promoting the Training and Supply of Midwives.

* A paper read before the North Western Branch of the Society of Medical Officers of Health on June 19th, 1908.

... by engendering a morbid condition of the tonsils, favourable to the growth of the diphtheria contagion if implanted thereon."—*Parkes and Kenwood, 1901, pp. 516, 519.*

"Evidence could be cited tending to show that the disease is fostered by decomposing heaps of manure and vegetable refuse, such as are found about stables where sheep, cattle, and other animals are kept.

Outbreaks of diphtheria have been reported where this condition existed in close proximity to dwelling-houses. The drainage from decomposing animal and vegetable matter imparts to the soil a serious contamination. The digging up of old drains, especially those connected with dwelling-houses, has been followed more than once by an outbreak of diphtheria. Surely the upturning of soil thus polluted is a fertile source of diphtheroid sore throats, or pseudo-diphtheria, if not of the true disease itself. At any rate, it cannot be denied that the emanations from such a source act as a predisposing cause to precipitate an attack when the diphtherial entity is present."—*Welch and Schamberg, 1905, p. 605, Art. Diphtheria.*

"Among the more indefinite sources of infection are defective drainage, decomposing substances, sewer gas; and while it cannot be denied that certain insanitary conditions conduce to the impairment of general health, to catarrhal conditions about the throat and nose, and thus render the system less able to withstand the assaults of any infectious disease to which it may be exposed, nevertheless, the presence of Löffler bacillus is absolutely essential to the production of diphtheria."—*W. P. Northrup—Nothnagels Encyclopaedia, Art. Diphtheria, p. 23.*

"In spite of the facts which suggest that it may arise in other ways—for instance, in connection with bad drains, and in newly-inhabited houses which have been built on made soils, and the occasional prevalence of ordinary sore throats just before an epidemic of actual diphtheria—it is probable that infection from a preceding case is the source of it in all cases."—*Taylor—Medicine (7th Edition) p. 115, Art. Diphtheria.*

"A close relation between imperfect drainage or a polluted water supply and diphtheria has not been determined."—*Osler—Medicine, 1901, p. 138.*

"It does not arise from drains nor is it carried to any great distance in the air. Diphtheria is a contact disease."—*MEDICAL OFFICER OF HEALTH, LEEDS. (Annual Report) 1906, p. 99, Art. Diphtheria.*

In Chester, in 1907, there were notified 201 cases of diphtheria, and in only nineteen houses was any evidence elicited on examination, of offensive smell or defect generally included in the term drain nuisance. And, in these nineteen cases, the source of infection was, in eight cases, almost certainly not associated with defective drainage, leaving a possible eleven cases or 5·4 per cent. of the

whole number in which no source was ascertained but where the drains on testing gave evidence of various defects.

The incidence of the disease was not confined to the worst drained portion of the city; it was not worse in the worse drained part than in the rest of the city—indeed, the badly drained district escaped almost completely for a considerable time after the rest of the town had been invaded.

The distribution of the disease was not parallel to the known distribution of poor and defective drainage.

These facts do not lend much support to the popular belief, and are hardly the material upon which to base even a loose association between diphtheria and defective drainage.

If this association has any basis in fact, it would be reasonable to find evidence of it forthcoming by the examination of the air in drains.

I have repeatedly exposed moist swabs, moist slides, serum agar and blood serum culture tubes, serum agar and blood serum petri dishes, at varying heights and in different positions, and at changed inclinations to the horizontal in the inspection chambers of houses and hospitals where diphtheria was present, and have never yet been able to find the Klebs-Löffler bacillus by such means.

I have examined the throat secretions of men daily engaged in sewers and in shovelling sludge with a like result; these men were not picked men and did not undergo a medical examination before employment.

Inquiries elsewhere into the health of sewer men have led to the belief that the constant breathing of sewer air was not injurious to health and life, but it must be remembered that those inquiries were not exhaustive, and the men concerned were said to be picked men working in well ventilated sewers—it was found that they suffered somewhat from ophthalmia.

In the cases of diphtheria at Chester, the history of an offensive smell, or of exposure to drain nuisances was practically unknown; these defects were only ascertained on actual testing.

There were no cases amongst stable men, or stable attendants, or others having to handle manure, or brought into close contact with the exhalations from it.

The same confusion and mis-statement,

erived from preconceived impressions at one time prevailed concerning malaria.

This disease was said to arise from a miasma; text books were especially emphatic at this point in the middle of the last century. Some authorities were so familiar with the exact nature and physical characteristics of this specific factor, that one might well imagine they were prepared to define its precise vapour density, and to give the exact measure of its electrical resistance.

But now that the exact researches of Avenar, Ross, Boyce, Bignami and Grassi have shown the significance of the haemamoeba and anopheles—the miasma as a causative agent in this connection is defunct.

Its decease dates from the time when it was conclusively shown that patients might live unharmed and malaria-free in the most marshy, swampy and pest-ridden district, provided only they took appropriate precautions against the mosquito.

So that in malaria, with the discovery of the special organism, the light came, and the etiology was placed on a sound and clear basis.

The wonder is why, with the discovery of the Klebs-Löffler bacillus, the same course of events has not ensued in the case of diphtheria.

Why has the drainage fetish lived in the etiology of diphtheria, whereas, the corresponding factor in malaria is as dead as Queen Anne?

If diphtheria is due to defective drainage, why does it attack chiefly school children and less adults?

Why does it affect new houses where the drainage is perfect?

The truth seems to be that defective drainage in this connection is one of those resuscitated causes which Herman terms "banal"—causes, however discredited, which the student learns in the lump, and introduces to the etiology of any disease when the opportunity offers—causes which might almost be termed "pathologically placid and universal."

Like the latest war scare, a drop in Consols, Grand Trunks, a large sun-spot, a retarded comet with orbit near the ecliptic, a railway strike, or dismissal of employes, they are supposed to depress body, soul and mind and produce a lowered resistance to infection.

These causes, imperfectly crystallised from the mother liquor of ignorance, recede as our knowledge grows and are gradually eliminated from consideration by serious writers to find at length a lasting refuge in the academic disquisitions of the law-courts.

Seeing, then, that the Klebs-Löffler bacillus was discovered by Klebs in 1883, and Löffler in 1884, why should diphtheria wait?

The time has now surely come to relieve it from the incubus of this make-shift association, and to place it in its proper light as a disease of contact and of person.

THE DUTIES OF COUNTY MEDICAL OFFICERS OF HEALTH.—At a recent meeting of the Isle of Wight County Council the following report was received from the General Purposes Committee: "We have received a letter from the Local Government Board relative to the appointment of Dr. J. A. Gibson as County Medical Officer of Health. The Board inquire whether it is intended that Dr. Gibson should retain the appointment of Medical Officer of Health for the Isle of Wight Rural District. If so, the Board state 'that they do not think it desirable that the medical officer of health for a district comprising the greater part of the area of the county should also act as medical officer of health for the county. Under such an arrangement it would follow that the advice tendered to the County Council on which they might base representations to the Board under section 19 of the Local Government Act, 1888, as to the failure of the Rural District Council properly to put in force in their district the provisions of the Public Health Act, 1875, would be tendered by the person who was responsible for the advice on the subject which had been given to the Rural District Council. In these circumstances the medical officer of Health would scarcely be in a position to give either to the County Council or to the Rural District Council advice that would be quite independent, and it might be that the advice given to the County Council would not be altogether disinterested.' We sent a copy of this letter to Dr. Gibson, asking for any observation thereon that he might wish to make. He has replied, stating that as the Board do not approve of his appointment as county medical officer of health while he holds the post of medical officer of health for the Isle of Wight Rural District, it is with regret that he asks the County Council to permit him to decline to act as their medical officer of health, as he is unable to resign a remunerative post for a non-remunerative one. A reply has been sent to the Local Government Board accordingly. No discussion ensued."

THE BACTERIAL CHARACTER OF SWEETENED CONDENSED MILK.

By E. KLEIN, M.D., F.R.S.,

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IN the course of an investigation into the bacterial character of a particular brand (Brand A) of sweetened condensed milk, I have had the opportunity of making a comparative bacteriological study on the constitution of various brands of sweetened condensed milk, some of those of deservedly good reputation and in general use in this country. It appears to me it might be advantageous to place on record the conclusions arrived at from this investigation.

The result of the bacteriological analysis of these samples—thirty-two in all—is summarised in Table A.

Column 1 denotes the name of the brand and the number of samples of each brand that have been analysed.

Column 2 states the number of microbes present in $\frac{1}{10}$ gram. of the milk that are capable of forming colonies, *i.e.*, of growing, at 20° C. in a gelatine plate. As this experiment is of less importance than that in the next column, I have made this analysis of only two of the six samples of Brand A, and of only one of each of the other brands. It ought to be stated also that the counting of the colonies that made their appearance in the plates was always made after three days' incubation.

Column 3 states the number of microbes present in $\frac{1}{10}$ gram. of the milk that are capable of forming colonies, *i.e.*, of growing, at blood heat—37° C.—in an Agar plate.

Column 4 gives the result of a broth culture infected with $\frac{1}{10}$ gram. of the milk and incubated for twenty-four hours at 37° C. In this column only one particular species, or rather group of species, is considered, *viz.*, Streptococci; for this reason: (1) Streptococci are at once easily recognised under the microscope; (2) they grow very readily in broth, and therefore the result, whether positive (+) or negative (—), can be ascertained by the microscope

alone and without further sub-culture. A further reason is this, that streptococci are always present in ordinary milk, *i.e.*, milk such as is generally collected in dairies and sold in shops. By paying attention in column 4 to streptococci only, it will not be inferred that other microbes, bacilli of various kinds, staphylococci and diplococci, were not present in the broth cultures. As a matter of fact, every one of the broth cultures of every sample of every one of the brands analysed contained either bacilli, or bacilli and staphylococci as will be mentioned below.

Column 5 gives the result of culture of $\frac{1}{10}$ gram. of the milk in Litmus glucose bile salt peptone water. The presence in this medium of acid or gas-forming microbes makes itself apparent after forty-eight hours' incubation at 37° C., the former by the change of the colour of the litmus into red, and the latter by the presence of gas in the inner fermentation tube.

Column 6 gives the result of adding $\frac{1}{10}$ gram. of the condensed milk to boiled ordinary milk, afterwards heated to 80° C. for ten minutes, then incubated anaerobically at 37° C. for 2–3 days. It will be noticed that the result is either indicated merely as + clotted, or as + enteritidis change; the former denotes the presence of sporing anaerobes capable of clotting the milk as a whole; the latter denotes the presence of sporing bacillus enteritidis sporogenes producing the well-known "enteritidis change" in a milk tube after infection with these spores.

It appears from these comparative analyses that all brands of sweetened condensed milk contain microbes aerobic and gas-forming anaerobic, some brands more than others, but even of the same brand one sample shows vastly different numbers of these microbes than another. This is not at all to be wondered at, considering that milk itself of the same derivation shows on bacteriological analysis, at different times and under different conditions, considerable differences. No milk is, or can be, under ordinary conditions, obtained free of microbes, and it has puzzled analysts to state anything like a bacteriological standard of purity. Considering that milk is not, and cannot be, collected in the dairy in an aseptic condition, and considering that there are microbes already in the milk sinuses of the teats of the udder of the cow, and con-

sidering that milk is an excellent medium for the growth and multiplication of microbes, it is obvious that differences will exist in the number and character of the microbes, according to the nature of collection, season, temperature, locality, and keeping of the milk.

The mode of producing the sweetened condensed milk does not permit of sterilisation, such as is the case in the production of tinned meats or tinned fruits, and it is therefore obvious that no brand of sweetened condensed milk can be free of microbes. The presence of microbes *per se* in sweetened condensed milk does not in general make it unfit or unsound any more than in fresh milk; as a matter of fact, fresh milk perfectly wholesome and sold by the best dairies will be found to contain large numbers of microbes, aerobic and anaerobic, often amounting to many thousands or even hundreds of thousands per cubic centimetre, and it is one of the most difficult problems to determine what should be a permissible number, that is to say, at what number of microbes should the line be drawn between sound and unsound milk. Quite recently the U.S.A. Bureau of Animal Industry Bull. 104 (*) published the results of the findings of a considerable number of "Medical Milk Commissions," in which the somewhat arbitrary line is drawn at from 10,000 to 30,000 microbes per 1 c.c. I do not think that a satisfactory line can be drawn as regards the number of general microbes. I have examined milk which was perfectly wholesome and sound, although it contained over 100,000 microbes, including streptococci, per 1 c.c. The only safe bacteriological standard of soundness is that the milk must not contain specifically pathogenic microbes, that it is not obtained from diseased cows, and that it is produced, collected, transmitted, and stored under clean and sanitary conditions.

And the same would apply to sweetened condensed milks. As the analyses show, no brands, not even those brands that have the best reputation and have never been challenged, are free of aerobic or anaerobic microbes, some samples containing them in considerable numbers. I will give illustrations by stating the results of the broth cul-

tures made of some of the samples of the various brands with 0.1 gram. and after incubation for 24 hours at 37° C.

- B. No. 1.—Very turbid—pellicle of sporing bacilli (*B. subtilis*), crowds of diplococci and short streptococci.
- B. No. 2.—Thick and very turbid—sporing threads of *B. subtilis*, motile bacilli, diplococci, and short streptococci.
- D. No. 1.—Fair turbidity—almost pure culture of diplococci and streptococci.
- D. No. 2.—Turbid, thick and viscid—bacilli, staphylococci, and abundance of streptococci.
- C. No. 1.—Fair turbidity—thin bacilli, very numerous streptococci of two kinds.
- C. No. 2.—Slightly turbid—sporing bacilli, numerous diplococci.
- F. No. 1.—Strongly turbid—motile bacilli, staphylococci, and abundance of streptococci.
- F. No. 2.—Strongly turbid—some bacilli, crowds of streptococci.
- I. No. 1.—Strongly turbid—numerous motile bacilli, crowds of streptococci.
- I. No. 2.—Very turbid—almost pure culture of streptococci.
- J. No. 1.—Slightly turbid—masses of *B. subtilis*, crowds of streptococci.
- J. No. 2.—Turbid—densely filled with yeast cells and streptococci.
- G. No. 1.—Slight turbidity—sporing bacilli, diplococci, and short streptococci.
- G. No. 2.—Very turbid—crowded with staphylococci and streptococci.
- A. No. 1.—Very slight turbidity—diplococci and streptococci.
- A. No. 2.—Slight turbidity—sporing bacilli.
- A. No. 3.—Very slight turbidity—sporing bacilli, few streptococci.
- A. No. 4.—Very slight turbidity—filamentous bacilli (*B. subtilis*), few streptococci.

* Medical Milk Commissions and the Production of Certified Milk in the United States, by Clarence B. Lane.

TABLE A.

1 Brand of Condensed Milk.	2 Number of Microbes growing at 20° C.	3 Number of Microbes growing at 37° C.	4 Presence of Streptococci.	5 Presence of acid or gas- forming microbes.	6 Presence of anaerobe spores tested by milk culture.
A. No. 1	75	128	+	—	—
" 2	...	117	—	—	+ clotted
" 3	...	250	+	—	—
" 4	350	about 800	+	—	+ enteritidis change
" 5	...	220	+	—	+ " "
" 6	...	480	+	—	+ clotted
B. No. 1	9	13	+	+ slight gas	+ enteritidis change
" 2	...	over 2,000	+	+ " "	+ clotted
" 3	...	62	—	+ " "	—
C. No. 1	150	69	+	+ slight gas	+ enteritidis change
" 2	...	over 2,000	—	+ " "	+ " "
" 3	...	about 300	+	—	+ clotted
D. No. 1	over 2,000	over 2,000	+	+ acid & gas forming	+ clotted
" 2	...	about 800	+	+ " "	—
" 3	...	about 500	+	+ " "	+ enteritidis change
E. No. 1	over 2,000	over 2,000	+	+ slight gas	+ clotted
" 2	...	over 2,000	+	—	—
" 3	...	about 300	+	+ slight gas	+ clotted
F. No. 1	...	21	+	—	—
" 2	...	over 2,000	+	—	—
" 3	2	16	—	—	+ clotted
G. No. 1	...	86	+	—	+ enteritidis change
" 2	...	about 300	+	—	—
" 3	93	36	+	—	—
H. No. 1	...	250	+	+ acid & slight gas	—
" 2	over 2,000	over 2,000	+	—	+ enteritidis change
I. No. 1	...	over 2,000	+	+ acid & slight gas	—
" 2	24	27	+	—	+ enteritidis change
J. No. 1	...	212	+	—	—
" 2	over 2,000	about 450	+	—	—
K. No. 1	340	436	+	+ slight gas	+ enteritidis change
" 2	...	over 2,000	+	+ slight gas	+ clotted

THE SANITARY INSPECTION OF HOUSES AND THE RIGHT OF ENTRY.—At Romford, on January 14th, Mr. Arthur Cornell, sanitary inspector to the rural district council, applied to the justices for an order of admission to premises known as "Glenroy," Hornchurch, in the occupation of Mr. W. H. Cowley Curtis, for the purpose of making an inspection of the drains. Mr. Cornell said that during the past few years there had been a great many cases of infectious disease at Hornchurch. The residents got alarmed, and a large public meeting was held, at which it was resolved to ask the rural council to petition the Local Government Board to send down an expert, because it was thought that the disease was due to insanitary conditions. Mr. F. J. Brockett was

appointed, and an inspection was being conducted, all kinds of defects being discovered. When the witness attended at the residence of Mr. Curtis he was refused admission. Mr. Curtis had written that he desired the inspector to produce an order of the Court before the inspection was made. Mr. A. E. Pearkes, who represented Mr. Curtis, contended that the local authority was not entitled to the order. Mr. Cornell, in cross-examination, said that out of 300 inspections made in Hornchurch the drainage in 298 cases was found to be defective. Mr. Pearkes said there was no illness in the house, and he thought that the council had shown no reasonable grounds for the application. The justices declined to make the order asked for, Major Stone observing that an Englishman's house is his castle.

THE MEDICAL INSPECTION OF CHILDREN AND ITS DEVELOPMENTS.*

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WHEN the Secretary of this Branch requested me to give a paper upon "The Medical Inspection of Children," I was tempted to comply with his request, because the subject is one that has occupied a good deal of my attention during the past few years. On the other hand, I felt inclined to refuse, because so many papers have been written already upon the subject that there might be some justification in assuming that the interest of the members of the Branch has been exhausted. Inasmuch, however, as most of such articles have dealt very largely with the actual processes of medical inspection, and have made an elaborate display of percentages and "results," I thought that there might possibly be some interest in a paper that kept figures, cards, notices, etc., mainly in the background, and that introduced some important problems and developments that have to be solved and anticipated.

Organisation.—Both details of organisation and difficulties encountered must vary considerably, according to two factors: (1) area of district, and (2) the previous work of the medical officer of health in the schools.

So far as area is concerned, the work can be much more easily arranged, and can be done with much greater rapidity and with more satisfaction to the chief medical officer in towns than in large rural districts and county areas. Inaccessibility must always play a very important part in any scheme connected with large rural areas.

Previous work must greatly influence the method of carrying out, and also the development of, the medical inspection of the children. Medical officers of health have had plenty of warning that this work was coming, and those who were in a position to do so should have previously organised complete systems of notification to them by teachers and by attendance officers of all cases of infectious disorders, as well as dirty, diseased, and suspicious cases actually in attendance at the schools. They should also have previously organised regular visiting of schools, as well as special visits to

schools by request of the teachers. All this should have been done before the work of medical inspection was forced upon local authorities, and those medical officers of health who had got thus far in their work in the schools have had reason to congratulate themselves upon the ease with which the further extension of the work in the form of routine medical inspection of the scholars could be brought about. In many districts, unfortunately, the precarious position and meagre pay of the medical officer of health has compelled him to work on the "minimum" lines.

In districts where nothing of this kind had been done, the present work has found the medical officer of health unprepared and with no existing links between him and the schools. As a result, very hastily improvised machinery has had to be put together, and one cannot wonder that in a large number of cases it has been found inadequate to deal with the great mass of material that has rapidly accumulated. Another important point is that if the work of routine inspection is the first medical work that has been introduced into any local set of schools, it is likely to strike outsiders as premature and undesirable, because they claim that special cases, such as infectious disorders, etc., should have received first attention.

In looking over the details of the schemes that are being used in many of the counties and large towns, I have been struck by the differences that exist in the methods employed. These different methods of carrying out the work are interesting because every one must have some reason for its peculiarities, and each will have to justify itself ultimately or be abandoned. I see no useful purpose that can be served by classifying and comparing the different schemes and the various methods. The proper time for that will be later on when they have had trial and have been pruned here and amplified there by their authors. After a time there will be many schemes and methods found wanting, and those that cannot justify their continued existence will have to give place to the more successful.

One can hardly hope to escape much longer, however, the carefully-compiled comparative statement of how things—ranging from the actual inspection and the details of office records to the amazingly different methods of destroying the elusive nit—are being done.

Circulars 576, 582, and 596, together with Art. 58b of the Code, should have effectually

* Read at a meeting of the Southern Branch of the Society of Medical Officers of Health, at Portsmouth, January 15th, 1909.

established uniformity in such vitally important matters as the selection of children for the routine examinations, the scope of the examination, and the form of the medical officer's report.

One point connected with the general organisation needs special mention. In connection with the work of any scheme of inspection, it appears to me to be very desirable that all communications concerning the work, to whomsoever addressed, and also all notices issued by his authority, should be signed by the medical officer and despatched from his office. No third party should be allowed to intervene between him and the people with whom he finds it necessary to communicate.

The Medical Inspector.—It does not seem long since a rather violent controversy was raging about the location of the new work. Was it to be a new venture in, and a development of, public health administration, or was it to be a new fad attached to the various education committees all over the country? Fortunately for the scheme the Board of Education took a statesmanlike view of the matter. The various methods of carrying out the law regarding medical inspection may be conveniently divided into four classes: (1) by a whole-time medical officer of health; (2) by a medical officer of health and whole-time assistants; (3) by a medical officer of health and general practitioner assistants; (4) by independent school officers. The influence of the Board of Education appears to be wholly in favour of 1 and 2, and no one who has had experience in the work can doubt that the Board is well advised to take this attitude. In fact, any other method, if persisted in, would undoubtedly seriously hamper and curtail the future developments of this important movement. Circulars 576 and 596 from the Board of Education show very clearly that the medical adviser of the Board intends to build his national scheme upon the broad basis of public health administration, a decision that future developments will abundantly justify. Careful reading of these circulars would show most people that the aims of the Board are much broader and far more ambitious and wide reaching than appear to have been appreciated up to the present time. If independent school medical officers became at all common, the development of these aims and ambitions would be seriously interfered with, and it is therefore not too much to expect that in the near future the whole of this work will be carried out by and through the public health machinery of the country.

The history of the attitude of the British Medical Association (as interpreted by the *British Medical Journal*) towards this work is curious. It is difficult to understand what the present official attitude of this body is, but at one time it appeared to favour the carrying out of the work by general practitioners and "specialists," and under the lead given by the *Journal* a number of local branches passed resolutions to the effect that the work ought to be carried out by general practitioners. I believe that some of these resolutions have been, and probably most of the members of the local branches would like to see them all, rescinded. A little practical experience in the work is rapidly showing that the attitude of the Board of Education upon this point is correct.

There is every reason to believe that towns and districts which are doing the work by methods 3 and 4 will eventually be brought into line with the obvious opinions of the Board of Education. A good illustration of this is afforded by the Borough of Smethwick, where a year ago the work was given to general practitioners acting under the medical officer of health. At the end of November, the Board wrote and asked the authority to reconsider the present tentative arrangements and to submit a revised scheme more suitable for the permanent organisation of medical inspection in the area. As a result of this strong communication, the local education committee have now decided to appoint a whole-time assistant for this work.

The following facts are now becoming generally recognised:—

1. A full-time medical officer of health in the smaller districts (particularly those districts which have up to the present obtained the services of a whole time officer for a salary of from £250—£400 a year) can do the work, and should be given it at properly increased pay.
2. In larger districts the medical officer of health should have entire control of such work because its organisation and development should be essentially upon public health lines. He should receive additional remuneration for the increased responsibility and work.
3. Part-time medical officers of health of districts that control their own educational affairs should have the school work added to their duties, and the combined duties should, whenever possible, constitute a whole-time position in such cases.

Requirements of the Board.—So far as the routine medical inspection of the children is concerned, it is quite clear from Article 58b in the 1908 Code, that arrangements must be made for the medical inspection of all children admitted to the schools since August 1st, 1908, and of all children who will leave school before July 31st, 1909. It should be particularly noticed that the Board apparently do not insist that all these children are to be examined during these particular twelve months, but merely that provision for their examination must be made.

The importance and immediate necessity of arranging for a proper machinery whereby these medical examinations of children can be made, appears to have caused the other obvious requirements of the Board to be temporarily ignored to a greater or less extent, and it does not appear to be generally realised that Circular 582 deals only with the schedule of medical inspection. A common error is to assume that it deals with the whole scheme. A reference to Circulars 576 and 596 should immediately convince everyone that Circular 582 merely deals with the medical examination as a single item among others equally important. The broad principles of the scheme are much more clearly outlined in Circulars 576 and 596.

The Medical Examination.—In order to keep the records of the work as simple as possible and at the same time easily available for the purposes of the annual report, it is absolutely necessary to work entirely upon an age basis. It is easily possible to make the scheme sufficiently elastic to include all the children referred to in Article 58b of the Code. For instance, in Hampshire, we started in 1908 by inspecting every child born during 1903, which clears off all the children whose fifth birthday occurs during 1908. This inspection will cause every school in the county to be visited, the work got into proper order, and any difficulties explained. Directly these 1903 children are all inspected, the inspectors will commence all the schools again, and will then examine all children born during 1904 (five-year-olds) and children born in 1896 (thirteen-year-olds). At these visits the teacher will be asked to present for examination any other children who may be expected to leave before July 31st, 1909, and at the same time the inspector is instructed to rapidly examine all children born after 1904

who happen to be at the schools. No details of these examinations of "under fives" are recorded unless the child happens to be one who will require further attention (a "special"). Beyond these, the number of normal children examined is the whole record that is kept of these very young children. It is not unreasonable to hope that in the near future all children under five will be eliminated from the school proper. These are the present arrangements for what we call the routine examinations. Any scheme that ends with making such arrangements will certainly be very severely criticised by the public, because it is easy to see that under the ordinary routine examinations, such as are being mapped out at present by most authorities, a child may escape examination for many years, and the fact that such a child may be dirty or diseased would constitute a serious flaw in any scheme. At each visit, therefore, of my medical inspectors to the schools the teachers are invited to present for examination all children who they consider cannot be described as normal, healthy and clean. The fact that teachers are making this selection well is shown very clearly by the following numbers:—1,735 children have been presented by the teachers, and 1,490 were found to be special cases, showing that 86 per cent. of the teachers' selections were justified.

Personally I should imagine that any scheme that includes only the examination of children who enter the schools after August 1st, and of those who leave before July 31st in a given school year, will rapidly find itself in difficulties.

The School Card.—Circular 582, together with the sample cards supplied by the Board of Education, clearly outlined the suggested scheme of medical examination. When these details appeared, some amusing misunderstandings were extremely common, and few appeared to realise that the various spaces and headings on the card were merely put there for the purpose of recording quickly any positive evidence that was found in any given case. Many critics assumed that each child would have to be so minutely examined as to either detect or definitely exclude all possibility of any and each of these conditions being present in any degree—just as in an elaborate insurance examination. As a result, it was quite common to hear the statement that the examination of each child would take nearly an hour. Of course, the obvious intention of

the Board was to outline a card upon which all ordinarily possible conditions could be recorded, and the present idea of medical inspection might very well be described as a rapid process of weeding out the abnormal from the normal, together with a rough classification of the abnormal. This can be done at a good speed, and ten or twelve children per hour is a very fair rate of work, especially when the teachers have done that part of the work which can be reasonably expected of them. Personally, I have never had difficulty in maintaining an average of fourteen per hour.

When these facts are borne in mind it is easy to see that the specialist has no place in the school, and to have dentists and expert eye men examining all the children in a given school is likely to bring ridicule upon the whole scheme. It is obvious that if the child is to be examined departmentally by experts it will have to be submitted to a dozen or more examinations before the ordeal is really over. There is certainly no reason why eyes and teeth should alone be examined by experts. The proper place for the expert is found when the question of treatment is being considered after the rough classification of defects has already been made.

The card in use in Hampshire is one that is, of course, based upon the sample card issued by the Board of Education, but it differs from it in one or two points.

1. On the front of the card are collected observations, the greater part of which can be very well recorded by the teacher, and concerning which a more continuous record should be kept than would be the case if only four entries were made during the nine years of ordinary school life. Such items include height, weight, chest measurement, nutrition, cleanliness, clothing, sight, etc.

2. This side of the card is therefore divided into nine columns instead of four, and the teacher is asked to fill up one column for each child each year.

3. By arranging for a rough classification of the children according to sight by the teacher, it is possible to save a considerable amount of time for the Medical Inspector, who only tests the sight of those children already found to be defective by the teacher. The medical inspector records the vision of such cases on the back of the card.

4. Items referring to accommodation in the house and the number of persons in occupation are added largely for future use. Their immediate value will, in most instances, not be very great, but it is impossible to read Circulars 576 and 596 without inferring that in the future they will play rather an important part in the scheme.

5. Chest measurement—maximum and minimum—is added as an object lesson of the importance of these measurements both to teachers and scholars. In this county these measurements are not being conducted with such a degree of exactness as to render the records available as reliable anthropometrical figures, but if, at any time some exact observations were undertaken, the place is ready on the card for such records. The omission of these particulars from a card would tend to minimise their importance, and to cause teachers and children to lose sight of the fact that these are vital measurements.

By altering the arrangement of the material and by having the larger sized card (10 inches by 6 inches) it is possible to have a considerable amount of space at the back for observations. By this means I hope to be able to do without the additional card for special cases, which will undoubtedly prove to be a great nuisance where adopted. In this county the cards of special cases are being distinguished by means of a clip, and when a child ceases to be a special case the clip is removed and the card slipped into its proper place among the others belonging to children of the same age.

Filing.—The filing of the cards is as simple as possible; the cards are merely arranged, boys and girls separately, into divisions according to the year of the child's birth, that is, the children born in 1904 are arranged behind the card 5, and so on. This arrangement is very easily understood by the teacher, and is much simpler than trying to classify the cards according to the date of the next inspection due. The special cases are arranged alphabetically behind the "special" index card until they cease to be specials.

Arrangements for Inspector's Visit.—The weekly programmes of the medical inspectors are arranged at the county office a week in advance. Notices are then sent to the head teacher telling them the suggested date and time of the visit, and asking them to return an enclosed card stating whether the suggested

time is convenient, and supplying the number of children awaiting examination. The appointment is then further confirmed from this office. The teacher distributes notices informing the parents of the date and time of the examination of their children, and inviting them to be present. The cards, already filled up to some extent by the teacher, are arranged alphabetically at the table, and the children are rapidly presented by the head teacher. An assistant teacher should sit at the table and rapidly copy the entries made by the inspector upon the cards into a summary sheet as each case is disposed of. The names of the children (in alphabetical order), together with the entries upon their cards made by the teacher, should have been previously copied upon the summary sheet.

All children that cannot be described as healthy, normal, and clean, and who will require further attention, have a clip placed upon their cards to distinguish them. If a child requires parental or medical attention, a notice is handed to the parent (or to the teacher to be sent to the parent) to that effect. I consider it to be of great importance that no definite diagnosis should be made upon these notices when medical attention is required. The fact that medical attention is necessary is all that should be pointed out upon such a notice, because it is extremely probable that these notices will be handed to the medical attendant when the required visit is made. A ready-made and exact diagnosis upon a piece of paper might offend the susceptibilities of practitioners and of many men at hospitals and dispensaries, and therefore should be avoided. There would also be a tendency to increase the probability of the parent going to the nearest chemist and asking for a bottle of medicine or complaint. The summary sheets are forwarded to the central office and classified and summarised there. This work is made easy by using separate summary sheets for different ages and sexes.

Following up Cases.—After an interval, the head teacher is communicated with, or a further visit is made to the school, in order to ascertain what steps have been taken with regard to the special cases. Cases of parental neglect—nit cases, etc.—are dealt with in much the same way as is the case in many towns and counties at the present time, i.e., by the use of successive notices to parents. Cases requiring medical or surgical attention are

attended to after the first notice in a fair proportion of instances. If nothing has been done, a reminder is sent, and if it is represented to me that the means of the parents render it impossible for medical or surgical attention to be obtained in the ordinary way, I endeavour to obtain help for these cases through local charitable agencies. In many cases the managers and local clergy are very willing to help, and I do not at present anticipate any difficulty in eventually securing attention for all those who need it.

The medical officer who freely distributes "exclusion" notices without having previously arranged his machinery for following up the cases, will soon find himself in difficulty. Many careless parents are delighted to get these notices, because they regard them as weapons with which the unwelcome attentions of the attendance officer can be disposed of. It is in this respect that the services of a good health visitor may be made particularly valuable.

Teachers and the Work.—The success of all work done in schools must necessarily depend upon the goodwill and hearty co-operation of the teachers, and it behoves all medical officers, therefore, to recognise this important fact, and to endeavour to secure their help. When I commenced the organisation of the school work in the West Riding in 1905, I very quickly made up my mind that in the majority of schools the teachers were willing to do, and quite capable of carrying out, a great deal of the preliminary work connected with the medical examination. It was also obvious that a great many of the teachers resented the idea of the introduction of nurses into the schools to do work that they themselves were capable of doing at least as well. For these reasons I have endeavoured to arrange for the inspection in the school to take place without help from school nurses in any form, and I am still of opinion that only in very rare and exceptional instances is there any necessity for the employment of a school nurse for work in the school itself. By this I do not wish to infer that there is no scope for the activities of a health visitor in following up these cases in their homes. I simply mean that the multiplication of officials dealing with the children in the schools is to be deplored, both from the point of view of efficiency and control of the work and from the teachers' standpoint. The best kind of teacher naturally resents the

introduction of an outsider into the school to do work that he or she is quite capable of performing equally well, and regards such as a personal indignity.

Another obvious point is that the teachers (both head and assistant) by their constant association with the children have acquired a large and valuable amount of knowledge concerning the normal condition of each child in the school. They are, therefore, able to record opinions concerning the nutrition, cleanliness and clothing of the child without a moment's hesitation and without making any special inspection of the child in question. The result is that if the record is made by them upon the child's card it is not only far more accurate as a description of the child's normal condition, but it also entails far less demands upon the school time for the doing of this work. Moreover, the records concerning height, weight, chest measurement and elementary tests of sight are far better made by the teacher because they are accustomed to handling their children and can fit in the work at some time most convenient to themselves and to the general working of the school. Teachers, after a little experience, will make these records far more quickly than anyone else because they are continually supervising the general movements of the children. On the other hand, if a stranger comes to the school to do this work it means a special appointment, the absorption of a part of the school time that may be regarded by the teacher as particularly valuable and, in addition, a far greater total interference with the ordinary work of the school.

Moreover, if all these observations are to be made at the time of the medical inspector's visit there, a notice must be given to the parents regarding it, and it is obvious that after such a notice a stranger visiting the school would be likely, in very many cases, to record entirely erroneous conclusions regarding the cleanliness of a great number of children.

In my work at Handsworth (Staffordshire) I therefore arranged for practically the whole of the front of the school card to be filled up by the teachers. This work was accepted by them without the slightest demur, and was carried out most admirably. Subsequently, in Hampshire, a similar scheme was introduced, and here again all the best teachers are doing the work excellently. Of course, in dealing with wide areas and large bodies of

teachers, there are bound to be a certain few who do the whole of their school work indifferently, and this new work will probably be done in a similar style to that in which the general work of the school is carried out. One must always expect a certain percentage of slackers and people who seize upon every loophole for shirking work. It is most encouraging to be able to record in a great majority of instances the very hearty approval of the teaching profession of this method of carrying out the work. The average teacher who is keen upon his work likes to retain in his hands as much as possible of everything that goes on in the school, and is pleased to have the fact recognised that teachers are fully capable of doing this work efficiently and well.

The executive of the National Union of Teachers at a recent meeting appear to have considered the matter to some extent, and to have come to some rather remarkable conclusions. Among the more curious of their recommendations are those which suggest that the head teachers should, on account of their special knowledge of the children, be present at the medical inspection, but *should not be required* to enter on school cards details respecting the state of clothing, footgear, cleanliness, nutrition, speech, mental condition, etc. This appears to amount to saying that the special useful knowledge that the head teacher may be expected to have concerning the children should not be used at all. Perhaps the most extraordinary of all is the recommendation that teachers "should not undertake the responsibility of answering any query concerning the mental condition of the child, which should be left to a thoroughly competent medical man." These statements remind me of the old days of hospital outpatient work, when a good lady occasionally presented herself, and in reply to the usual question, "What's the matter?" would say, "That's what I came to you to find out, sir." One is, of course, accustomed to occasionally meet members of the general public who regard a "thoroughly competent medical man" as an individual possessed with some kind of second sight, and as one who should be able to diagnose anything without asking a single question, but an official body of teachers should know a little better than this. Here again, the executive appear to have selected a point upon which the teacher, more than anyone else, should be able to supply

definite information, and have suggested that such information should not be supplied.

The time occupied in performing the teachers' part of the work has been exaggerated in some instances. In any given class of, say, fifty scholars, the whole of their cards should be filled up comfortably in less than two days of school work. Next year the same work might be easily done in about one day or less. So that after this year, and excluding five-year-old children, who will require new cards, the time occupied for each class of fifty children will be about one day per annum. Of course, it is neither necessary nor advisable that the whole column should be filled up during the same day, and the work will be lighter and more interesting if similar items on the card are taken at one time; but the total amount of time required should not exceed the above estimate. The medical inspection of these fifty children will take another day, but will only take place four times in nine years when the scheme is in full working order (*i.e.*, after 1910), giving an average of less than half-a-day per year. By adding the above times together it will be seen that the work of any given large class will be disturbed only during an average of one-and-a-half days per year. The work, moreover, should be made to have considerable educational value. From the above facts it is difficult to understand how the working of the scheme can be claimed to make any considerable demand upon the teachers' time and services, or that there can be any possibility of a consequent lowering of the educational efficiency of the school.

I have received confirmation of the above estimates from many teachers and several have informed me that they are doing their part of the work by the expenditure of an amount of time that is well under this estimate.

If the cards were filled up entirely by strangers visiting the school the teacher would be thrown idle while the work was being done, the disturbance of the school routine would be considerably greater, and the time occupied by the work would be greatly increased. This would be especially the case when infants are being examined. Further, it would necessitate the services of a large staff, and would enormously increase the working expenses of the scheme.

Every teacher who realises the responsibility of his or her position regularly inspects the children as regards their general cleanliness.

Also many teachers in the county have for several years been in the habit of testing the sight, and measuring and weighing the children every year. The present scheme simply requires the teacher to make these observations a little more exactly, and to record them on official cards.

Responsibility of the Parent.—In discussing this Act it is commonly stated that it represents a considerable decrease in modern parental responsibility. A little consideration should convince anyone that this is by no means the case. The proper administration of the Act should very definitely increase the average parental responsibility, and when the proper machinery is at work the number of neglectful parents should be very rapidly diminished. A definite practical method is now in our hands whereby we can compel neglectful parents to look after their children properly and to realise their due responsibility.

The Medical Practitioner.—Another natural result of the Act should be increased work for the general practitioner. So far, I have found that a considerable proportion of the notices informing the parent that the child requires medical attention causes the child to be taken to one of the local practitioners for treatment, and in several instances I have been told that the amount of work has thereby been increased, a fact that is not always appreciated by those practitioners whose work very largely belongs to clubs.

General practitioners who have at times given hasty and carelessly-considered decisions regarding such conditions as ringworm, sore throat, etc., have only themselves to blame if they acquire a certain amount of disrepute for such cases. If the fee that a given patient can afford to pay is altogether inadequate for the proper examination of the case, it is obviously the best course to state so frankly and to decline to give a certificate.

Development of the Work.—I have already described the actual medical examination as a single item among others equally important in the scheme. The medical inspection of the children is merely the commencement of the work in order to obtain necessary data. The next step will be the various necessary procedures for the amelioration of the conditions that are discovered, and, finally, a crusade of prevention will have to be inaugurated which should bring about a decrease in sickness,

inefficiency, and poverty. Logically, the final result would be most quickly arrived at by beginning with prevention, but for humanitarian reasons it is necessary to attempt amelioration first, or, at all events, at the same time. There is not the slightest doubt that at the present time the conditions of life of a large number of young children, both at home and at the school, are such as to prevent the full and effective development of their organic functions, their special senses, and their mental powers. The aim of the present movement is to remove these obstacles and to bring about increased well-being of the people by decreasing the number of those unfortunates who are handicapped in life's struggle by diseased, unhealthy, or undeveloped bodies or minds, and who are continually joining the ranks of the pauper or the criminal classes.

Amelioration and Treatment.—By the exercise of a certain amount of tact and care it is possible to persuade the parents to secure proper treatment in a very large percentage of cases that are found to be in need of it. Of the remainder, there should be to our hands very shortly some easily available method of dealing with those parents who can afford the necessary treatment and who wilfully neglect to obtain it. There still remain the children who are supposed to be provided for under the Poor Law, and also those whose parents' circumstances are such as to render it impossible for them to pay for medical treatment and yet are not such as to cause the child to be provided for under the Poor Law. So far as my experience goes, the most difficult problem is to secure proper treatment for those unfortunate children who are supposed to be provided for under the Poor Law. In fact, I have found it practically impossible to obtain any reasonably successful course of treatment for such children.

Circular 596, 7 (g), page 8, contains a suggestion that has caused a great deal of soreness among the members of the medical profession. The apparent willingness of the Board to entertain proposals for a local authority to contribute to the funds of hospitals, dispensaries, and nursing associations is, to say the least of it, unfortunate. Such a procedure would be very rightly resisted to the utmost extent by the profession. All arrangements for treatment at the public expense should be made between the public

authority and the members of the medical profession without any intervention of third parties in the shape of hospital or any other lay committees. One cannot believe that it is in any way the intention of the medical advisers of the Board that the development of this most important national scheme should be based upon an extension of charitable work. The medical profession has already suffered sorely through the abuse of hospitals and other charitable agencies, and will certainly decline to have its services further exploited in this way. This most important matter has been dealt with to some extent by a Report of the Medico-Political Committee, and the Divisions of the British Medical Association are being urged to consider the matter and to oppose the suggestion. But it does not appear to be realised that many education committees are already approaching the committees of hospitals and dispensaries, and are about to begin to bargain with them for medical services.

On the other hand, common sense should impel us to use *existing* charities as far as possible for suitable poor cases. The organisers of such charities ought to welcome the help of the school inspector because his diagnosis and notice stating that treatment is required should prevent the misuse of hospital and other notes. It is only the *extension* of existing charitable agencies by doles of public money that the profession must oppose. Of course, the natural development of the scheme and the only apparent way out of the present difficulty would be the creation of a public medical service.

Prevention.—The work of prevention and the methods of its organisation cover too large a field to be discussed now, but the subject should be an interesting and important one for a future meeting. In connection with the school buildings there are the important details of space, lighting, warming, ventilation, and cleanliness, all of which subjects vitally affect the health of the children, and concerning which the medical officer should therefore be the recognised authority. The school work itself will present to the medical officer important problems concerning desks, attitudes, type, sewing, and the spread of infection by books, pens and pencils, as well as the quantity and quality of the instruction in hygiene and the physical exercises. The children themselves will present personal

problems in the way of economical feeding and clothing, the classification of defective children ("defectives"), and the methods of dealing with children in an infectious condition (these children might very reasonably be called "infectives.") Still further, the medical officer's work of prevention will have to include the improvement of dirty, damp, and overcrowded homes.

Necessary Further Developments.—Unfortunately all public health efforts are continually hampered and neutralised by a glaringly defective Poor Law system. Unrecognised and untreated disease and ill-health among the poor is, as we all know, appallingly common. These conditions serve as a continual and ever present focus for the spread of disease among the general public, and there is thus constituted a grave public danger. The only possible way to remove such a danger is to devise improved and more easily available means of treating these cases. This is precisely where this work of school inspection will probably represent the beginning of a great reform. It is true that at present treatment can be attempted only with difficulty, but it is to be hoped that in the very near future the whole of the present Poor Law system will be removed entirely, and that in its place we may have put into our hands more enlightened methods that will not only tend towards an improvement of the race, but will also considerably increase the public sense of safety by securing proper medical diagnosis and treatment for every case of disease altogether apart from any consideration as to whether it is accompanied by destitution or not.

The still more recent Public Health (Tuberculosis) Regulation dated December 18th, 1908, whereby the notification of cases of tuberculosis among the poor is secured, represents another step forward in this direction. Possibly the revision of the Poor Law, which appears to be on the eve of accomplishment, will secure these desired reforms at once, but whether it does or does not it should be clearly recognised by all public health workers that their efforts towards the improvement of public health will continue to be hampered and neutralised to a large extent so long as untreated and practically unknown disease is rampant among the poor.

The care of the children's health has now

been definitely placed in the hands of the public health service of the country; this has been followed by an arrangement for securing for the members of that service a knowledge of all pauper cases of tuberculosis. Is it too much to hope that the whole system of Poor Law medical work will soon become a part of the public health organisation, and that the dawn of a new era of health for the nation will thus be secured?

MIDWIVES ACT COMMITTEE.—The third meeting of the departmental committee appointed by the Lord President of the Council to consider the working of the Midwives Act was held at the Privy Council Office, on Thursday, February 4th, 1909. Mr. Almeric FitzRoy, C.V.O., was in the chair. Miss Bertha M. Broadwood, Honorary Secretary and Director of the Cottage Benefit Nursing Association, and Miss Rosalind Paget, Honorary Treasurer of the Incorporated Midwives Institute, attended and gave evidence on behalf of their respective institutions.

PHYSICAL CONDITION OF GLASGOW DAY INDUSTRIAL SCHOOL CHILDREN.—At the meeting of the Glasgow Juvenile Delinquency Board held on December 24th, the following letter was read from Dr. A. K. Chalmers, Medical Officer of Health for the city:—"With reference to the inquiry which was conducted some considerable time ago into the physical condition of the children attending certain Board schools, and three of the industrial schools of Glasgow, I find that there are certain differences between the boys attending Rose Street, Rotten Row, and William Street Day Industrial Schools and those attending Gorbals, St. James', Dovehill, and Milton Street Board schools. In height, for example, the difference is in favour of the Board school boys at each year of age six to thirteen, save at age twelve, but the difference in weight is less marked. I was scarcely prepared for this, and particularly for the almost uniform excess in height of the Board school boy, especially in view of Mr. Legge's reports regarding the residential schools of the Delinquency Board, and the difference is probably to be explained by the fact that the day industrial school child comes from the most neglected households, while the reformatory boy is removed wholly from home influences. This has, however, opened up the question of dietary, and I have been led to compare the sheets which you were good enough to give me with others. Owing to the fact, however, that quantities per child are not stated in your scheme of dietary, I will esteem it a favour if your directors will sanction the weighing of the actual quantities consumed, say, by five children selected at ages 6, 7, 8, etc., to 13, in one of the schools, for a period of three days. We should be prepared to carry out this inquiry at once if we have your approval." It was agreed that the information desired by Dr. Chalmers be sent to him, and Mr. Bathgate stated that a Committee had been appointed to consider the whole question of feeding in the schools.

ANTHROPOMETRY. IN ELEMENTARY SCHOOLS.*

By F. C. SHRUBSALL, M.D., M.R.C.P., D.P.H.

ANTHROPOMETRY is the art of measuring man—the corresponding science, anthropometrics, deals with the establishment of correlations between the physique and the various factors of human inheritance and environment.

While it is probable that valuable information, even from the hygienic standpoint, might be derived from a detailed study of the changing dimensions of the growing child, considerations of time render it advisable, in all investigations on a large scale, to confine the preliminary enquiry to those features which, while capable of being rapidly recorded, serve most completely as tests of the general health and state of nutrition. The measurements required by the Board of Education are those of stature and weight, which amply conform with the foregoing postulates. Both measurements can be made rapidly with simple apparatus; neither demands special training.

The only apparatus required to ascertain the stature is a graduated rod, a plummet, and a set square. The plummet is necessary to ensure the rod being held vertically; if the rod is attached to a wall the alignment can be made once and for all, but it must not be overlooked, as many walls are not truly vertical. The subject must stand erect, barefooted or in socks, with his back to the scale, his eyes directed to the horizon, his heels firmly planted, and the pads of his feet only lightly in contact with the ground. The latter is a precaution to avoid any apparent increase due to standing partially on tip-toes. The set square is applied to the rod and moved from above downwards until it is in contact with the head of the subject, when the stature is read from the scale. The various forms of apparatus with sliding indicators present no additional advantages, while some forms in general use in which the measurement is made on a short graduated rod which does not reach the ground may yield inaccurate readings owing to their not being fixed at an absolutely correct height. The subject should

not be measured while wearing boots or shoes, since all attempts to make allowance for the height of the heel introduce considerable error besides wasting time.

The record should be accurate to the nearest centimetre or half-inch. Greater refinement than this is quite unnecessary, as the extra decimal places will almost certainly be ignored in making up averages for groups of several hundreds of children. Greater accuracy would also involve the necessity of taking into consideration the diurnal variation in stature and ensuring that the measurements were always taken at the same time of day and after similar conditions of posture and occupation. Of course this might be advisable if any special investigation were being carried out on a limited number of subjects. Scales accurate and graduated only to half-inches or centimetres are naturally less expensive than those with finer sub-divisions and the risk of making errors in reading are proportionately reduced. When the attention is concentrated on reading to millimetres, errors in centimetres are more likely to creep in.

Three types of weighing machines—balance scales, spring machines and steelyards—are in general use.

Machines of the first type are the simplest and the least liable to get out of order, but present a great disadvantage in the time and labour involved in shifting the actual weights for each subject. In small country schools such a form might be available or easily borrowed which would save trouble in transport. Spring weighing machines present the advantage of rapid manipulation, and are easily carried and hooked to any convenient beam or branch of a tree. It is, however, necessary to note that the pointer returns to zero after each observation, and advisable to test the accuracy of the scale record from time to time by means of standard weights. There are several forms of steelyard machine varying in the form of the platform and the manner of estimating the weight. In some the larger part of the weight on the platform is counter-balanced by loose weights suspended from the long arm of the steelyard, while the finer adjustment is made by a small sliding weight. This takes up a good deal of time if changes in the larger weights are often necessary. The form in which there are two parallel bars on one of which slides a heavy weight to record

the larger units, and on the other a smaller weight for the final adjustment of balance is more convenient.

Both forms need testing from time to time.

The subjects should be weighed as far as possible under uniform conditions. The ideal method would be to weigh each when clothed in a dressing gown of known weight which can be deducted from that observed, or which could be previously counterpoised. This is quite impracticable in schools. If gymnastic costume is worn for physical exercises it would be the best for these observations, but generally all that can be done is to record the average weight of the clothing of each group of children. This varies considerably; the range in a series of hospital patients aged ten to fourteen years was from five to twelve pounds, the greatest difference being in the footgear, which varied between three-and-a-quarter pounds and six ounces.

It is therefore desirable that the children should be weighed without coats or overcoats and without boots.

In any case every report should state the conditions under which the measurements were made.

It is sufficient to record the weight to the nearest pound or half-kilogramme, the metric system being preferable. Greater accuracy is useless since no two observations will be made under precisely similar physiological conditions; and the weight of an adult presents a daily variation of some two to three pounds, and there is a proportional change in children.

A uniform system of recording ages is essential if groups of children in different districts are to be compared. In making up averages it is usual to deal with groups of each year of life, reckoning from the last birthday, but on the actual record card it is better to make a complete statement of age in years and months so that it could be available for any further data that might be sought.

The plan most often adopted in publishing results is to record the average dimensions of each age group for boys and girls separately. The average may be somewhat misleading owing to the influence of a few individuals presenting unusual traits, so that, when possible, all observations should be recorded in full. The dimensions of the individual members of any population show a wide range of variation, even when all are of the same racial stock, and live under uniform conditions

of environment. This range increases with age until all growth has ceased. Thus in the middle-class schools of Boston, Massachusetts, Bowditch showed that while at the age of five the tallest boy exceeded the shortest by eleven inches, at the age of nine the corresponding difference in stature amounted to nineteen inches. It is therefore advisable to append to the table of averages a statement of the range of variation, and of the number of individuals in each group. The quantitative estimate of the variation or degree of dispersion is known as the *standard deviation*. The methods of ascertaining this quantity would occupy too long a time to be dealt with in this lecture, but those interested may be referred to the Report of the Medical Officer (Education) to the L.C.C. for 1907, pp. 10-16, while for a discussion of the general methods they may refer to Karl Pearson's "Grammar of Science."

The records having been made, it is necessary to endeavour to explain the meaning of any considerable divergencies between the averages of different groups. The chief points to which attention may be drawn are:—Age, heredity and environment.

If one group contained many children just past a birthday, and another many a large proportion just approaching the next, the averages for that year of life in the two groups might differ considerably without indicating the action of any cause other than age. This is not likely to occur in dealing with large groups of children whose ages would be fairly uniformly distributed, but must be remembered if a small group is under consideration. Beside actual age it is necessary, especially in dealing with individual children, to remember that the physiological and temporal ages may not coincide. Thus, if the physiological age be estimated by such factors as the number of teeth cut, it will be found that the average dimensions of those who have cut many teeth are greater than the average of those who have cut a smaller number. This difference is subsequently made up. A similar relation has been shown by Ward Crampton to exist between physiological age and scholastic attainments. This is of importance in view of the system of superannuation in force in certain public schools since, obviously, it is the physiological rather than the temporal age which should receive attention.

The hereditary factors are usually referred

*A Lecture delivered at the Rooms of the Society of Medical Officers of Health, on January 12th, 1909.

to as racial. Thus, the average dimensions of children living in the East of Scotland are greater than of those in North Wales, from whom they differ in other characters, such as the pigmentation of the hair and eyes. In referring to the peoples of Western Europe, it is usual to distinguish three races who present characteristic associations of physical characters. These are:—

The *Nordic*, or Teutonic, long-headed, tall and fair, who occupy the countries bordering the Baltic Sea and the Eastern portions of the British Isles.

The *Mediterranean*, long-headed, short and very dark, who inhabit the South of Europe, but have outliers in the Western portions of the British Isles.

The *Alpine*, broad-headed, but intermediate between the others in stature and colouration. This race derives its name from the central mountainous region in which it is found in greatest purity, but sends outliers across Auvergne into Brittany, and is possibly slightly represented in our population.

In the British Isles, hair and eye colours form the easiest available test of race. The hair colours are classified as fair, red, light brown, dark brown, and black; the eyes as light (blue and grey), neutral, and dark (brown).

For further details, "Beddoe's Races of Britain" may be consulted.

The problem of finding suitable standards for comparison is complicated by the phenomenon that the distribution of racial types is not the same in urban and rural districts. In Great Britain, the Continent, and in the United States, it has been shown that there is a tendency for the short, dark-haired element to collect in the great towns. In London, the darkest population, excluding alien immigrants, is to be found in the poorer and overcrowded central districts, while the suburban areas present a far greater proportion of fair-haired children.

It therefore seems necessary at present for each district to form its own standards, checking the possible influence of race by noting the colouration of each individual measured, and recording the averages and variations for each colour-type when a sufficient amount of material has been collected. The numbers at present available are far too small to allow of the publication of standards for the stature of children of different ages classified according to their colour-type, even if reference

to the action of environment were omitted. So far as they go, they point to fair and light brown-haired children being distinctly taller than the dark brown, black, and red haired. Also that light eyes are more often found in taller, and dark eyes in shorter children, but this only applies to large groups; in small areas the combinations are liable to wide variations.

The racial factor is worthy of attention, the absence of any record having spoilt many otherwise valuable contributions to anthropological literature on the influence of environment and social status.

The influence of environment on the rate of growth and on the standard of physique begins in pre-natal life when hardships or ill-health of the mother check the development of the child, though the effect on the child of partial starvation of the mother are much less than the subsequent effects of diminished nutrition in post-natal life.

The suitability and sufficiency of the food supply in early infancy exerts long lasting, if not a permanent influence. Russow detected the superiority in physique of the naturally fed child as late as the twelfth year.

In later life the physique appears to vary almost directly with the social status of the group under investigation. Several factors are concerned in the production of this phenomenon. Initially there is an hereditary element; the upper classes being nearly everywhere the descendants of the dominant race. Where two races come into contact, all the advantages of environment and power of selection of mates are in favour of the superior. Under modern conditions, the upper classes are able to choose their abode at will, and to spend a part of the year in the country, thus escaping the dangers of a continuous urban environment. They are exposed to no privations, and can avoid all influences tending to stunt growth.

Comparative statistics are available from many quarters, all showing the superiority of the children of the upper classes in stature, weight and thoracic perimeter. Often, however, the racial factor, which has been omitted, is such as to render deductions uncertain.

A marked difference in physique has been noted between country-folk and town-folk, the former being the taller and heavier. In Glasgow and Edinburgh this difference

amounts to as much as four inches in stature, and thirty-six pounds in weight; in London to only an inch-and-a-half and ten pounds.

Observations have shown that many great continental cities, in contrast with rural districts and small towns, present an excess of both tall and short individuals; the richer quarters being occupied by a tall, and the poorer by a very short population. This differentiation appears to be progressive. Ammon studied the conscripts of Baden over a series of years, thus obtaining information as to the physique of the entire young adult population during this period. He classified them into four groups—Urban, when both parents and conscripts were of town birth; Semi-urban, when the parents were born in the country but had immigrated into the towns; Semi-rural, when the conscripts, though born in the country, had been transferred to the town in early life; Rural, when the conscripts and their parents had always lived in the country. He found a progressive diminution of stature accompanied city residence.

Similar results have followed an investigation on a much smaller scale into the physique of Londoners.

It is probable that the most physically-fit section of the rural community comes to the towns in search of higher wages.

The physique of the citizen is worst in the central and most crowded areas, best in the suburbs.

Leslie Mackenzie has shown that in Glasgow the average stature and weight of children varies almost directly with the number of rooms occupied by the family, while Thomas, in London, indicated that though the physique undoubtedly varied with the number of rooms occupied, it bore a still closer relation to the number sleeping in a room. Overcrowding is not only accompanied by deficient ventilation and increased exposure to chronic microbial infection, and consequent ill-health, but also involves a smaller and less suitable food-supply, owing to the meagreness of the family exchequer. A change from these surroundings rapidly improves the children, who grow more in a short time than those not previously subjected to depressing influences.

CENTRAL MIDWIVES BOARD. — NEW MEMBER APPOINTED.—The Lord President of the Council has been pleased to appoint the Hon. Mrs. Charles Egerton to be a member of the Central Midwives Board in the place of Miss Jane Wilson, resigned.

POISONING BY FERRO-SILICON ON BOARD SHIP.

ON December 21st, the Grimsby coroner concluded the inquest upon the bodies of the five Russian emigrants who died suddenly on board the steamship *Ashton*, during the voyage from Antwerp to Grimsby on December 13th. The deceased were bound from Russia to America, via Antwerp, Grimsby, and Liverpool, and were all in good health when the vessel left Antwerp on the night of December 12th. Next morning the steward found four of them lying dead in their berths between decks, while the fifth was dying. It was at first suspected that cholera was the cause of death, and the ship was quarantined and portions of the deceased's anatomy were submitted for bacteriological examination.

Captain Millward, the master of the *Ashton*, was the first witness called, and he described in detail the position of the berths of the emigrants, which was situated between decks and directly above the forehold. There was a hatchway communicating between the places amongst the cargo. In that hold witness stated there were nine tons of ferro-silicon in barrels.

He had never heard of ferro-silicon before, but was informed that it was liable to explode if confined, and liable to fire when wet. He did not know that it gave off poisonous gases?

Witness went on to say that all five emigrants died within half an hour, and though he noticed no smell in the emigrants' quarters, he was very ill after visiting them. He concluded that he was suffering from shock.

John Alfred Foster, analytical chemist, of Hull, said he experimented with samples of the ferro-silicate from the *Ashton*. He found it to be composed of iron silicate, carbon, phosphorus, and arsenic. He found that five gases emanated from the mixture—arseniuretted hydrogen, phosphoretted hydrogen, acetylene, pure hydrogen, and sulphuretted hydrogen. Four of the gases were highly poisonous, and the fifth, hydrogen, was of an asphyxiating nature. Arseniuretted hydrogen was so terribly poisonous that its discoverer, Gahlen, died through inhaling one single bubble of the pure gas. Phosphoretted hydrogen was scarcely less deadly. In less than twenty-four hours the nine tons of ferro-silicon would generate 110 cubic feet of extremely deadly gas, assuming it was dry; if the chemical were moist there would be thrice the volume of gas.

He added that Captain Millward's symptoms were those produced by inhaling the gas. The early symptoms of ferro-silicon poisoning were often mistaken for cholera and ptomaine-poisoning. The gas decomposed the blood and produced death.

Dr. William Bulmer Simpson, Medical Officer of Health, said that the bacteriological examinations conducted by the Government expert proved negative in character, showing that the deceased did not die from cholera, ptomaine poisoning, or from consumption of crude poison. The lungs, on the other hand, were congested and full of blood, suggesting asphyxia by noxious fumes.

The Coroner said this was the first time in England that death had been proved to be due to ferro-silicon, and he hoped it would have the effect of preventing so dreadful a substance being carried in ships used for passengers.

The jury returned a verdict that the deceased died from inhaling poisonous gases, but they exonerated the ship's officers from blame.

APPOINTMENTS.

GERALD F. BIRD, M.B. Cantab., has been appointed Medical Officer of Health of the Borough of Godalming, Surrey.

ARTHUR LECHE, M.R.C.S., L.R.C.P., Edin., has been re-appointed Medical Officer of Health of Axbridge (Somerset.)

P. T. TOLPUTT, L.R.C.P. and S. Edin., L.F.P.S. Glas., has been appointed Medical Officer of Health to the Neyland U.D.C.

F. D. CREW, M.R.C.S., L.R.C.P., has been appointed Medical Officer of Health to the Higham Ferrers Town Council.

D. G. DYKES, M.B., has been appointed Medical Officer of Health to the Martley R.D.

E. R. F. MASON, L.R.C.S., L.R.C.P. Edin., has been appointed Medical Officer of Health to the Gomersall R.D.

G. CLARK TROTTER, M.B. Edin., D.P.H. Aber., has been appointed Medical Officer of Health to the Burgh of Paisley.

J. D. WELLS, M.B., Ch.B. Edin., has been appointed Medical Officer of Health to the Billericay U.D.

BERRY CECIL, L.R.C.P. and S. Edin., has been appointed Assistant Medical Officer for Schools to the County Borough of Wigan.

HENRY HERD, M.B., Ch.B. Edin., has been appointed Assistant School Medical Officer to the Manchester Education Committee.

R. BURNET, M.B., D.P.H., has been appointed Medical Officer of Health to the Borough of Bury.

E. F. M. NEAVE, M.D. Edin., has been appointed Medical Inspector of School Children to the Manchester Education Committee.

W. CRAIK, M.B., C.M. Glas., has been appointed Medical Officer of Health to the Thurnscoe U.D.

MEYRIK-JONES, M.R.C.S., L.R.C.P., has been appointed Medical Officer of Health to the Charlton King's U.D.

J. W. G. MYLER, M.D. Brux., F.R.C.S. Eng., L.R.C.P. Lond., D.P.H. Lond., has been appointed Medical Inspector of Schools to the Rhondda (Glam.) Education Committee.

KISSING THE BOOK.—On February 1st the Mayor of Salisbury, at the City Petty Sessions, announced that the custom of kissing the Book was to be discontinued in the Court, and that the Scotch form of administering the oath to witnesses would supersede it. The Mayor said the decision had been arrived at by the Bench in consultation with the Watch Committee and the Medical Officers. The new form of oath would be administered to the police and other official witnesses, and as many other persons as could be persuaded to take it.

REVIEWS.

GOODALL and WASHBOURN's Manual of Infectious Diseases. Second Edition, revised by E. W. Goodall, M.D. Pp. XII. and 426. Price 14s. net. H. K. Lewis.

The twelve years that have elapsed since the appearance of the first edition of this book have witnessed considerable advances in the knowledge of infectious diseases, and Dr. Goodall in preparing the second edition has found it necessary to make many changes both in subject-matter and in arrangement. The book has been thoroughly revised, a very large amount of new information has been added, and the result is that the second edition is practically a new book. Among the chief additions are three new chapters on glanders, cerebro-spinal meningitis and plague, and an admirable series of photographs illustrating important diagnostic features in the rashes of the chief diseases. There has been but little increase in bulk, the number of additional pages being only fifty-eight, and the book is still convenient to handle; but a great deal more subject-matter has been got into each page. The epidemiology of the diseases has been more fully treated than in the first edition, and the value of the book, particularly for the public health worker, has thereby been considerably enhanced, while more detailed information has been given on the important subject of diagnosis.

Dr. Goodall has read widely in the literature of his subject, but in most of the diseases he describes, he writes chiefly of his own experience. He has formed definite opinions which, though avoiding dogmatism, he is not afraid of stating. In the treatment of laryngeal diphtheria, he prefers intubation to tracheotomy—at all events in hospital practice—and he gives an excellent description of the former operation. He disapproves of the use of antitoxin as a prophylactic measure against diphtheria, and thinks it should be strictly limited to "cases where the risk of infection has been very great, or where the removal of those affected by diphtheria, and of those apparently healthy individuals, from whose fauces the bacilli have been obtained, has failed to stop an outbreak in a children's institution." He is of course fully convinced of its therapeutic value, and is of opinion that it should be given to any patient who is suffering from diphtheria, however slight. In the dietetic treatment of typhoid fever the author observes a wise conservatism. While the temperature is above normal, he relies almost entirely on milk, and he evidently has a poor opinion of the "feeding up" methods advocated by some modern clinicians.

The book is interesting to read, but its chief merit is its practical usefulness. It is what a medical text-book ought to be—a thoroughly serviceable tool. It gives the right kind of information and gives it in the right way. It is, in short, the best book on infectious diseases in English. To the medical officer of health the appearance of this edition is particularly welcome; but no doctor, whatever his special work may be, can afford to neglect infectious disease; and every doctor who wishes to keep his knowledge up to modern requirements will do well to add the second edition of "Goodall and Washbourn" to his library.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

A GENERAL MEETING of the Society of Medical Officers of Health took place at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, February 12th, 1909, at 7.30 p.m., when the following members were present:—Dr. Edward Sergeant (President), Drs. W. H. Symons, S. C. Lawrence, T. H. C. Stevenson, J. Tubb Thomas, F. J. H. Courtts, R. A. Lyster, E. H. Snell, G. F. Jones, W. J. Butcher, J. M. Martin, G. F. McCleary, F. E. Fremantle, Jas. Kerr, Chas. Porter, T. Strain, H. R. Kidner, F. Robinson, H. Beale Collins, L. E. Wilson, H. A. Hall, A. M. Davies, J. T. C. Nash, H. L. P. Hulbert, C. W. F. Young, Wm. Butler, Sir Shirley Murphy, Herbert Jones and W. Whitaker, F.R.S.

The Minutes of the previous ordinary meeting held on January 8th, 1909, and published in the February issue of PUBLIC HEALTH, were taken as read, approved, and duly signed by the Chairman.

The HON. SECRETARY reported the receipt of several letters from members regretting their inability to be present.

ELECTIONS.

The following candidates having been duly nominated were balloted for, and the President declared them to be unanimously elected:—

AS FELLOWS.

Spencer W. Badger, M.B., Ch.B., D.P.H., Richmond Road, Wolverhampton; T. W. Beazeley, M.B., D.P.H., City Hospital, Little Bromwich, Birmingham; J. G. W. Boleyn, M.D., 6, Selborne Avenue, Low Fell, Gateshead-on-Tyne; Dunstan Brewer, M.R.C.S., L.R.C.P., D.P.H., 3, St. John's North, Wakefield; Robert Burnet, M.B., M.Sc., D.P.H., Limefield House, Limefield, Bury; Katharine S. Clark, M.D., D.P.H., Danesdyke, Castleford, York; Josephine Coupland, M.B., B.S., 37, Park Square, Leeds; William Craik, M.B., C.M., Goldthorpe, Rotherham; W. H. Davison, M.B., D.P.H., 20, Emscote Road, Warwick; Mary A. S. Deacon, M.B., B.S., Tor View, Yelverton, R.S.O., Devon; E. S. Galbraith, L.R.C.P. & S.E., L.F.P.S.G., D.P.H., Park View, Acomb, York; S. A. Henry, M.B., B.C., D.P.H., 107, Drake Street, Rochdale; W. Davies Higson, M.B., Ch.B., D.P.H., South Dispensary, Liverpool; C. W. Hutt, M.A., B.C., D.P.H., Health Department, Warrington; E. W. Rees Jones, M.D., D.P.H., 21, Sirley Street, Blackpool; H. M. Joseph, M.A., M.B., B.C., 7, Harcourt Road, Sheffield; Arthur King, M.D., C.M., D.P.H., Belmont, Station Road, Watford; J. Dickinson Leigh, M.D., F.R.C.S., D.P.H., 4, Ravensworth Terrace, Durham; W. A. Macnaughton, M.A., M.D., D.P.H., County Buildings, Stonehaven; R. Sydney Marsden, M.B., B.Sc., D.P.H., Birkenhead; Harry Mason, M.B., B.S., D.P.H., Ryby Villa, East Parade, Harrogate; Eva McCall, M.B., Ch.B., D.P.H., 33, Huddersfield Road, Barnsley; L. B. McMaster, M.D., B.Ch., 25, King's Road, Rochdale; David McKail, M.D., D.P.H., 10, Binnie Place, Monteith Row, Glasgow; Elizabeth M. McVail, M.B., Ch.B., 11, Willow Terrace, Sowerby Bridge, Yorks; C. H. Melville, F.B.C.M., D.P.H., Lieut.-Col., R.A.M.C., War Office, S.W.; Lucy Pinniger, M.B., Ch.B., B.Sc., 94, Waterloo Street, Edin.; Ralph D. Smedley, M.A., M.D., D.P.H., The Ethel, Durham; Harry Stansfield, M.B., Ch.B., Clayton, Bradford; B. C. Stevens, M.D., M.S., D.P.H., Mayo House, Lancaster; C. E. Tangye, M.D., 7, Avon Place, Warwick;

Wm. Templeton, M.B., Ch.B., 38, Windsor Road, Doncaster; Claude M. Vernon, M.R.C.S., L.R.C.P., D.P.H., Stoke House, Ashford, Kent; James Wood, M.B., Ch.B., D.P.H., 381, Huddersfield Road, Oldham.

The HON. SECRETARY, referring to the resolution passed at the previous meeting of the Society relating to the nomination of members from districts where warning notices had been issued by the British Medical Association, stated that he hoped to make arrangements in conjunction with the British Medical Association by which such elections to the Society would be prevented, but in any case, much would depend upon the members themselves in making nominations to the fellowship.

PRESENTATION of the portrait of Dr. Vacher on behalf of the North-Western Branch. Dr. F. J. H. Courtts said that, as an old member of the North-Western Branch, it afforded him great pleasure to make the presentation on behalf of his former branch. He felt quite sure that every member of the Society would appreciate the gift of the portrait of one who had done such good work in the public health service as Dr. Vacher, and that all who knew him would regret his retirement into private life.

The PRESIDENT, in accepting the portrait, said that, as a member of the North-Western Branch, it was an added pleasure to receive Dr. Vacher's portrait on behalf of the Society. Dr. Vacher was one of the founders of that branch in 1876, which was the first branch of the Society of Medical Officers of Health to be established in the country. They all admired the work that had been done by Dr. Vacher, and sincerely regretted his retirement from the public health service. On behalf of the Society, he thanked the North-Western for their welcome addition to the collection of portraits.

The HON. SECRETARY gave notice that the date of the Provincial Meeting at Leeds had been fixed for July 24th, that the members would proceed to Harrogate, and from thence to Ripon, where they would be entertained by the Mayor, proceeding by motor in the afternoon to Fountain Abbey, and subsequently being received by the Marquis of Ripon.

Dr. T. H. C. Stevenson then read a paper on "Administration of School Inspection." The following members took part in the subsequent discussion:—The President, Drs. Barwise, Sir Shirley Murphy, F. E. Fremantle, W. H. Symons, W. J. Butcher, James Kerr, Wm. Butler and J. T. C. Nash. The proceedings closed with a hearty vote of thanks to Dr. T. H. C. Stevenson for his paper.

North-Western Branch.—A meeting of the North-Western Branch was held at the Victoria Hotel, Manchester, on Friday, January 15th, 1909. Present: Dr. W. M. Hamilton in the Chair, Drs. Marsden, Greenwood, Peck, Garstang, Daley, Paddock, Arnold, Welsh, Wood, Wilkinson, Young, Hitchon, Corbin, Sergeant, Holt, Harper, Wheeldon, Wheatley, Edlin, Fraser, Dearden and Barlow.

Minutes of the previous meeting were read, confirmed and adopted.

The following were unanimously elected Members of the Branch:—Dr. H. Osborne, Assistant M.O.H., Salford; Dr. Stitt, School Medical Officer, Bootle; Dr. C. W. Hutt, Assistant M.O.H., Warrington.

Dr. A. Gibb Glass, M.D., Assistant M.O.H., Burnley, was nominated for election.

Secretary reported on the last meeting of the Council held in London, on January 8th.

It was resolved that, in place of the meeting it was proposed to hold at Preston, if it were possible, a second meeting of the Branch should take place in Liverpool.

Dr. Sydney Marsden, M.O.H., Birkenhead, read his Paper on "Some Aspects of Physical Degeneration." In the discussion which followed, Drs. Sergeant, Barlow, Wheatley, Peck, Corbin, Edlin and Hamilton, took part, and a hearty vote of thanks was passed to Dr. Marsden at the close.

Southern Branch.—Minutes of meeting held at the Town Hall, Portsmouth, January 15th, 1909. *Present:* Drs. Lauder (President), Cameron, Fraser, Gibson, Griffith, Lyster, Stephens and Willoughby. The minutes of the last meeting were read and confirmed.

Eight Fellows of the Society were elected members of the branch.

Dr. R. A. Lyster read a paper* on some practical points in the organisation of the medical inspection of school children in the county of Hampshire. A discussion followed, in which all present took part, especial reference being made to the attitude of the school authorities towards hospitals. At the close of the discussion the following resolution was moved and carried unanimously:—

"That this branch notes with regret the clause D 7 (g) of the Board of Education's Circular No. 596 referring to the use of hospitals in the treatment of school children; this branch is of opinion that the matter calls for the attention of the Society of Medical Officers of Health, and respectfully begs the Society to consider it."

Home Counties Branch.—The fourth meeting of the Session was held on Thursday, January 21st, 1909. In the unavoidable absence of Dr. Nash, County M.O.H. for Norfolk, his paper was read by the Hon. Secretary. The subject was "The House-fly and other Insects as Carriers of Disease." In the subsequent discussion, Mr. W. Whitaker, Drs. W. Butler, Sanders, Cane, Sharman, Habgood J. F. Taylor and the President joined.

At the commencement of the meeting, on the motion of Dr. J. S. Tew, the hearty congratulations of the members present were given to the President of the Branch (Mr. F. E. Freemantle, County M.O.H. for Hertfordshire) on his two recent appointments:—(1) As representative of Medical Officers of Health on the Departmental Committee appointed by Lord Crewe to consider the revision of the Midwives Act, 1902, and (2) as the Edward Jenner Lecturer on Public Health at St. George's Hospital Medical School.

Metropolitan and Home Counties Branches.—A conjoint meeting was held on Thursday, February 18th, 1909, at 1, Upper Montague Street,

* Published in this month's PUBLIC HEALTH.

Russell Square, W.C. Dr. Bond, President of the former branch, was in the chair. Amongst those present were:—Drs. Seaton, Louis Parkes, Fremantle, C. W. F. Young, Gerard Taylor, J. Clarke, Sowden, R. A. Dunn, A. E. Porter, Tate, Habgood, Meredith Richards, Butler, McCleary, Wellesley Harris, A. M. Davies, Annis, F. J. Allan, Lennane and S. C. Lawrence as members of the branches, and Drs. J. Bernstein and Randle Harper as visitors.

The Rev. S. Barnett, Canon of Westminster and Chairman of the "Children's Country Holiday Fund," opened a discussion on the subject of "Country Holidays for City Children." First, he briefly sketched the career of the Fund, which commenced with the dispatch of 5,000 children in 1884, and at its last season (1907) was the means of securing a fortnight's holiday in the villages for 41,970 London children between the ages of five and fourteen. The object of the Fund is to obtain for London children a wholesome change of environment such as would improve them physically and mentally, whilst leaving pleasant memories behind for the long winter months of the immediate future. About one-quarter of the cost is borne by the parents, who pay weekly contributions for the purpose.

The selection of village homes, he said, is made by ladies and gentlemen of responsible position in the country, and to them the 5s. a week per child is in the first instance sent. This charge includes board, lodging and washing. These country correspondents also endeavour to provide some entertainment by games, etc., for the little visitors from town, to which the country boys and girls are also welcomed.

The Canon stated that he was well aware that the "country holiday" movement met with some hostile criticism from residents in country districts, and therefore he asked for the sympathetic co-operation of the medical officers of health amongst the home counties to aid in disarming them. For instance, he thought that the local M.O.H. could assist the country correspondents in securing the proper kind of cottage homes, and in dealing promptly and inexpensively with any case of infectious disease that may—in spite of all precautions—break out amongst the London children.

As country people largely benefitted by visits as in-patients to the London hospitals, so country people, in turn, should not begrudge townspeople the great benefits to be derived from a short holiday in their locality.

Dr. Seaton proposed, and Dr. Louis Parkes seconded, that a hearty vote of thanks be given to Canon Barnett for his interesting account of the "Country Holiday Fund." This was put to the meeting by Dr. Bond from the chair and carried by acclamation.

Dr. A. E. Porter said that Reigate was a favourite locality for London children, and that the risks of the introduction of diseases such as scarlet fever and diphtheria should be well guarded against by the managers. The school summer vacation was an inconvenient time for tracing out and dealing with such cases. He suggested that no child known to have been recently in contact with

diphtheria germs should be sent down to the country till at least one negative result had been obtained from cultivation of swabs from the throat and nose. Dr. Porter further gave two examples of cottages grossly overcrowded by visiting children, and he asked Canon Barnett why he preferred cottages to camps?

Dr. Fremantle, President of the Home Counties Branch, who occupied the vice-chair, expressed the hope that similar conjoint meetings between the Metropolitan and Home Counties Branches will be held, when other important matters arise affecting both, e.g., the provisions of the coming "Pure Milk Bill." He also suggested that the local M.O.H. should always receive advance notices of any party of youngsters coming into his district, as to the houses they were coming to, and the number assigned to each. He had known children, taken ill after their arrival, either neglected or taken to a chemist for advice; this misguided action might lead to the other children developing infectious disease after their return to London. He was uncertain as to the amount of moral benefit mutually received by the town and country boys and girls associating together.

Dr. Gerard Taylor observed that country cottages in Berkshire were usually fully occupied without any visitors, and few, if any, could take more than three children as boarders. He emphasized the importance of medical advice being procured for these visitors promptly when needed.

Dr. Allan suggested that the weekly lists of the Metropolitan Asylums Board might be studied with advantage by the M.O.H.'s and the management for a few weeks before the children's holiday began. It was his own practice to stop all the children from a tenement building with a common staircase when there was one case of infectious disease in the building.

Drs. Annis and Lennane also joined in the discussion.

Canon Barnett, in acknowledging the vote of thanks, observed that the many points made in the discussion had been noted by himself and Mr. Blackiston, the Secretary of the Fund, for their future guidance. The latter mentioned that in 1907 there were only five cases of scarlet fever and two of diphtheria reported amongst the (nearly) 42,000 children sent into the country by his society. Canon Barnett said that the average number sent to each cottage was two-and-a-half, and that, in cases of illness, country correspondents were authorised to get advice from a doctor at once. As regards camps, he regarded them as only suitable for boys and those over fourteen years of age. Moreover, life in camps amongst other town children was not so complete a change as a life spent in common with the girls and boys of the countryside. The cost of camps was at least double that of boarding in cottages and, lastly, if infection did break out in a camp, the misfortune affected a large instead of a limited number of contacts. In conclusion, Canon Barnett expressed his belief that most of the complaints

had arisen, not from the management of the Fund, of which he was Chairman, but from the want of careful management on the part of some local societies who, whilst preserving their independence, could do better and more satisfactory work by carrying it out on the same lines as, and in affiliation with, the "Children's Country Holiday Fund."

THE LIBRARY.

All Books and Publications received by the Editor and by the Hon. Librarian will be acknowledged under this heading.

Annual and other Reports.

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The Break-up of the Poor Law.

The Minority Report of the Poor Law Commission, Part I., 7s. 6d. nett. The Public Organisation of the Labour Market. The Minority Report of the Poor Law Commission, Part II., 5s. nett. Edited by Sidney and Beatrice Webb. Longmans and Co.

The Public Health Agitation, 1833-1848.

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Air Infection of Minor Importance, by C. V. Chapin, M.D. Diphtheritic Paralysis, by J. D. Rolleston M.A., M.D.

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VOL. XXII.

THE DUBLIN OUTBREAK OF MILK-BORNE ENTERIC FEVER.

SIR CHARLES CAMERON, has recently issued a report on the outbreak of enteric fever that occurred in Dublin last autumn. The facts relating to this outbreak are so remarkable that we hope no medical officer of health will lose an opportunity of studying Sir Charles Cameron's report, which affords an excellent illustration of the difficulties that may attend the control of the milk supply even in the actual presence of a grave public danger.

The outbreak began on September 28th, and continued until November 2nd, and the total number of cases directly infected was 130, including three patients who developed the disease a few days after leaving the infected district. The area affected by the outbreak contained 748 houses, of which 193 were supplied with milk from one dairy, the remaining 555 houses obtaining milk from 28 other dairies. Eighty-two houses were invaded by enteric fever, and of these 79 were supplied with milk from the suspected dairy; and it is practically certain that the infected occupants of the remaining three houses had consumed milk from that dairy. On investigation it appeared that the dairy was well kept, and that the cows were free from disease. The dairyman and his family exhibited no sign of recent illness, and all the persons connected with the work of the dairy denied that they had ever had enteric fever or that they had recently been ill. The total number of cows was fifty-eight, of which thirteen were kept within the curtilage of the dairy, and the remainder in certain fields. The milk from the cows kept in the fields was stated to be distributed to the consumers without being first taken to the dairy, and it was on the consumers of this

milk that the chief incidence of the disease fell. Sir Charles suspected the infection to be derived from a carrier case, and he requested the dairyman to suspend temporarily all the persons engaged in milking the cows and in distributing the milk. This request was refused. He then suggested that the dairyman should engage a competent bacteriologist to examine all the persons connected with the dairy, to determine whether any carried typhoid bacilli. This advice was taken. A distinguished bacteriologist was called in, who made his examination about October 17th, and immediately afterwards one of the men, whom Sir Charles suspected of being a carrier case, was taken from the dairy work and his place supplied by another man. Soon after this event the outbreak ceased. The bacteriologist, however, regarded his examination as confidential, and refused to divulge his results to the medical officer of health.

When, in the early days of the outbreak Sir Charles had satisfied himself that the disease was being spread by infected milk, he endeavoured to put the law in motion to restrain the sale of the milk, but the Corporation's legal advisers held that in the existing state of the law no legal action could be taken. The Local Government Board for Ireland then suggested that action should be taken under Section 4 of the Infectious Diseases (Prevention) Act, 1890, and subsequently that the Corporation should obtain counsel's opinion. This was done and the counsel upheld the view of the Corporation's advisers. The Board then took the opinion of their own counsel, who advised that a Court would probably construe the section so as to bring the case within it. This opinion was submitted to the Corporation's counsel, who maintained his former view, and the Corporation decided to take no further action. But by this time it was November 26th, and the outbreak was over!

THE RETIREMENT OF DR. VACHER.

ON February 13th, Dr. Francis Vacher resigned his post as County Medical Officer of Health of Cheshire, and by his retirement the public health service loses one of its most valued members. In our present issue we give a reproduction of the portrait of Dr. Vacher recently presented to the Society by the North-Western Branch, and we may be permitted to recall some of the services he has rendered to the Society and to the cause of public health.

Dr. Vacher was one of the founders of the North-Western Branch of the Society of Medical Officers of Health which, however, was originally a separate society called the North-Western Association of Medical Officers of Health. This Association was formed on February 12th, 1875, and Dr. Vacher was one of the two secretaries appointed at that time. In 1878 he became sole secretary of the Association, and in 1888, when the amalgamation with the Metropolitan Association took place and the North-Western Association became the North-Western Branch, he retained his post as secretary, and continued to hold office until 1894, when he resigned after nineteen years' service. In 1895 he became President of the Branch, and in 1895-96 President of the Society. He has taken a keen interest in the welfare of the Society, which owes much to his efforts.

Dr. Vacher is a native of London, and he received his professional training at the University of Edinburgh. In 1873 he was appointed Medical Officer of Health of Birkenhead, a post he held for nineteen years, and in 1893 he became County Medical Officer of Health of Cheshire. His public health work is well known, but his official duties have by no means exhausted his interests. He is an ardent temperance worker, and he has taken a leading part in various philanthropic movements. The literature of public health has received many valuable contributions from his pen, and two, at least, of his books have become standard works. Dr. Vacher in his retirement, carries with him the esteem and good wishes of his colleagues, and, though his career as an active medical officer of health is over, we trust he will continue to take part in the work of the Society, and that he may long be spared to inspire by his presence and counsel those who are still treading the thorny paths of the public health service.

THE ADMINISTRATIVE CONTROL OF TUBERCULOSIS.

THE rapidly increasing list of official documents relating to tuberculosis has recently received two important additions, both of which emphasise the need for increased preventive activity. The first of these is the Report of the Delegates of the British Government to the recent International Congress; the second is Dr. Newsholme's Memorandum on the Public Health (Tuberculosis) Regulations, 1908. The Report contains an interesting account of the chief matters dealt with at the Congress. The resolutions that were adopted by the Congress afford striking evidence of the recent advance of opinion in relation to tuberculosis. It was resolved that compulsory notification, the establishment of tuberculosis hospitals, sanatoria and dispensaries, the prevention of bovine tuberculosis and of the conveyance of tuberculous infection from man to man, were measures that ought to be taken for the prevention of the disease. On these resolutions the delegates observe that

"it is satisfactory that on such a momentous question there should be practical unanimity of scientific opinion, and of administrative aspirations; and there is thus opened up the prospect of rapid extension of administrative measures against the disease, and of much more rapid decline than in the past of the heavy mortality caused by it."

Dr. Newsholme's Memorandum has been issued to all the urban and rural sanitary authorities in the country, and there is no doubt that it will exercise a profound effect on public health administration. The Local Government Board, in their accompanying circular letter, point out that, although the Regulations apply only to patients who come under the care of poor law medical officers, the Memorandum has been extended so as to deal with preventive measures notified under a voluntary system; and they trust that sanitary authorities, in connection with their medical officers of health, will "take such action as may be practicable of the kind indicated in the Regulations and Memorandum." The Memorandum is a carefully considered statement of the administrative measures open to sanitary authorities; the recommendations it contains rest on a sound pathological basis, and we hope they will be widely adopted throughout the country.



FRANCIS VACHER, Esq., F.R.C.S. (Edin.), M.R.C.P.
President of the Society of Medical Officers of Health, 1895-1896.

THE CONVERSION OF OLD COWSHEDS.*

By J. H. GARRETT, M.D., D.P.H.,
Medical Officer of Health, Cheltenham.

THE conditions under which milk is produced are commonly of the most unsatisfactory description. The degree of filthiness in and about the cowsheds extends from the floor of the shed and the deposits in the yard, to the bodies of the cows, to the persons of the milkers, and to the milk. The foulness of the atmosphere in and about the shed is often sickening in its intensity, and the operation of milking carried on in partial darkness cannot be witnessed without creating the feelings of abhorrence and disgust.

But although to any ordinary observer the production of milk in such surroundings appears to be highly improper and dangerous, the farmer or cowkeeper himself, and his

production of milk, we have to deal with the structural and actual conditions of the cowsheds and their precincts, and endeavour to awaken in the milk producer a recognition of those duties and requirements which pertain to the proper conduct of his trade. There is a third factor, namely, the health of the cow, which, however, I do not intend to refer to in this paper, excepting so far as it is influenced by the condition of the cowshed, and in this connection I may say at once that the influence of the dwelling upon the health of the cow is very great, even as in the case of human beings, and of the utmost importance in connection with bovine tuberculosis in particular.

Experience shows that of all the moral influences that can be brought to bear upon the obdurate persons engaged in the production of milk that is most effective which



The front has been taken out of this Cowshed and the space in front of the shed for a distance of four yards enclosed by a wooden screen; the whole of the enclosed space, including the floor of shed, is covered with cement concrete.

servants, owing to the hardening influence of long use, remain oblivious to the bad conditions, or are even contemptuous of them. Thus, in urging reforms to ensure the cleanly

* Read before the Midland Branch of the Society of Medical Officers of Health on December 3rd, 1908.

touches the financial side of the matter, and the conversion of the cowkeeper, and the regeneration through him of all his servants, are desiderata which lie chiefly with the purchasers of the milk. The medical officer

of health, however, must make himself instrumental in informing the consumer of the risks he runs in purchasing a carelessly-produced milk, or a milk derived from a dirty farmstead. The medical officer of health also

affected by private interests—many of them being milk producers—as rather to take umbrage at the proposition for radical reforms in the conduct of the business than to give the required support. On the other hand



The space in front of this Cowshed for a distance of 4 yards has been railed off from yard and paved with hard bricks. Note large permanent openings for ventilation and light.

requires to exercise all his opportunities of lecturing and tutoring the milk producer, although such perpetual admonitions may not always be received in the spirit in which they are tendered.

Less personal and more material, and consequently more easy, is the task of dealing with the cowsheds so as to raise them to a condition of structural sufficiency, though here the matter requires to be taken hold of with firmness by the officer, who must be backed by the Council, with whom alone lies the power of compelling compliance with orders served for work to be done. Up to this moment some sloth, amounting perhaps even to neglect, has been evident in the conduct of the medical officers of health in this connection. They unfortunately have, however, an all too potent excuse in pleading the fact that the Councils they serve are so

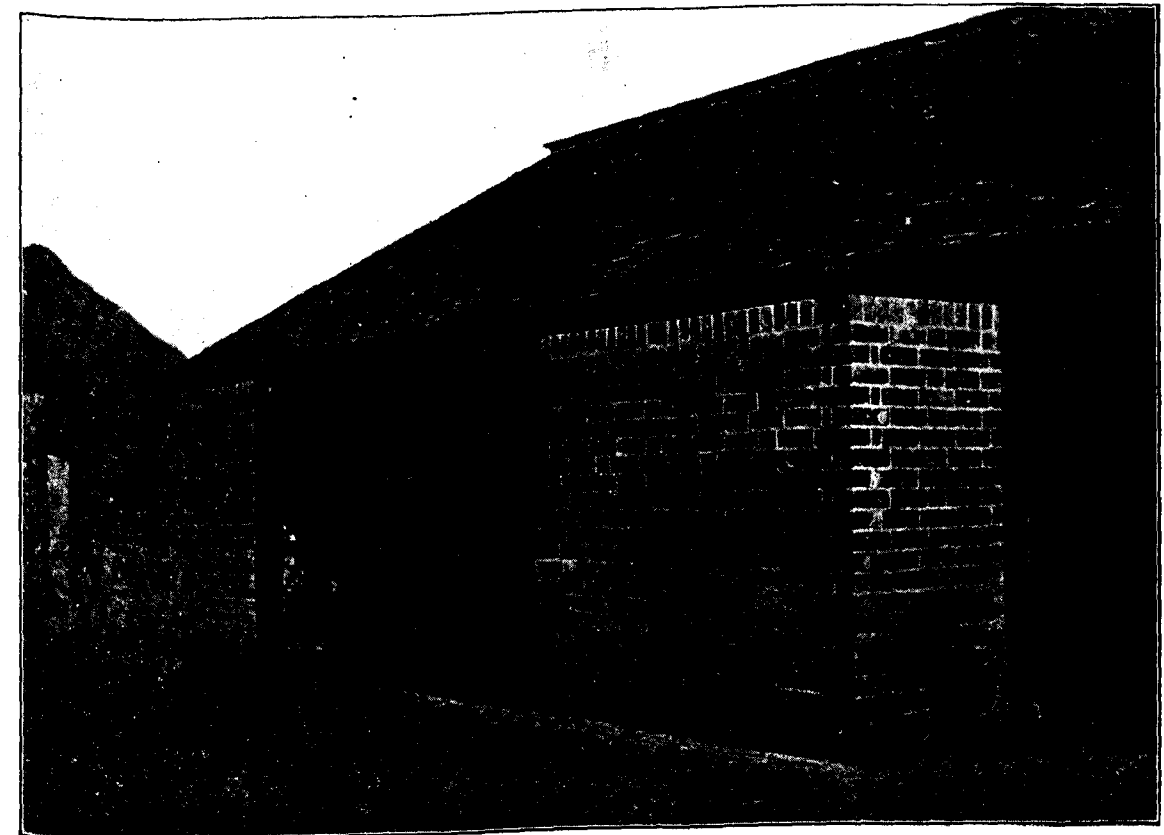
some of the officers have themselves been subject to similar interest, being in private practice as well as being medical officers of health, and afraid of the unprofitable effect of urging action that must result in considerable cost or loss to their clients.

To systematically carry out this work is a large business in many rural districts, requiring much time and application on the part of the officers; and in such districts, even should they by chance happen to be sufficiently well officered, some courage will be required in attacking the work.

The experience gained here in what I believe to have been a fairly effective effort to convert the old cowsheds may be of interest therefore, since so much of this work remains to be carried out all over the country. Our cowsheds are for the most part of quite an ordinary sort, being situated about the borders

of the town, usually in close connection with a farmhouse. By conversion of the sheds, one means the carrying out of such alterations as to comply with all essential requirements, and so far as structure of the shed and condition

must also be had to the Nuisance Sections of the Public Health Act, 1875, and the places be dealt with as being "premises in such a state as to be a nuisance," and as permitting "any animal to be so kept as to be a nuisance," etc.



In this Cowshed the front wall has been brought forward bodily 3 feet, leaving an unroofed area of that width in front of shed. Overcrowding is thus reduced, and when louvres have been placed on the roof ridge there will be very free ventilation. The result would have been better had the wall been two courses of bricks lower.

of surroundings is concerned, to make it only a matter of care in keeping to ensure the place being always in a condition of maximum cleanliness and suitability.

First, as to the legal powers which enable action to be taken. The regulations adopted under the Dairies, Cowsheds and Milkshops' Order, 1885, usually closely follow the model code issued by the Local Government Board, only slight modifications being permitted. The cowkeeper is made responsible for carrying out the whole prescription of these regulations. The cowkeeper is generally only a tenant in occupation, and there are several requirements in these regulations, which ordinarily would be looked upon as the work of the owner of the place. It must not, however, be supposed that what is required to convert old cowsheds can be obtained by compliance with these regulations. Recourse

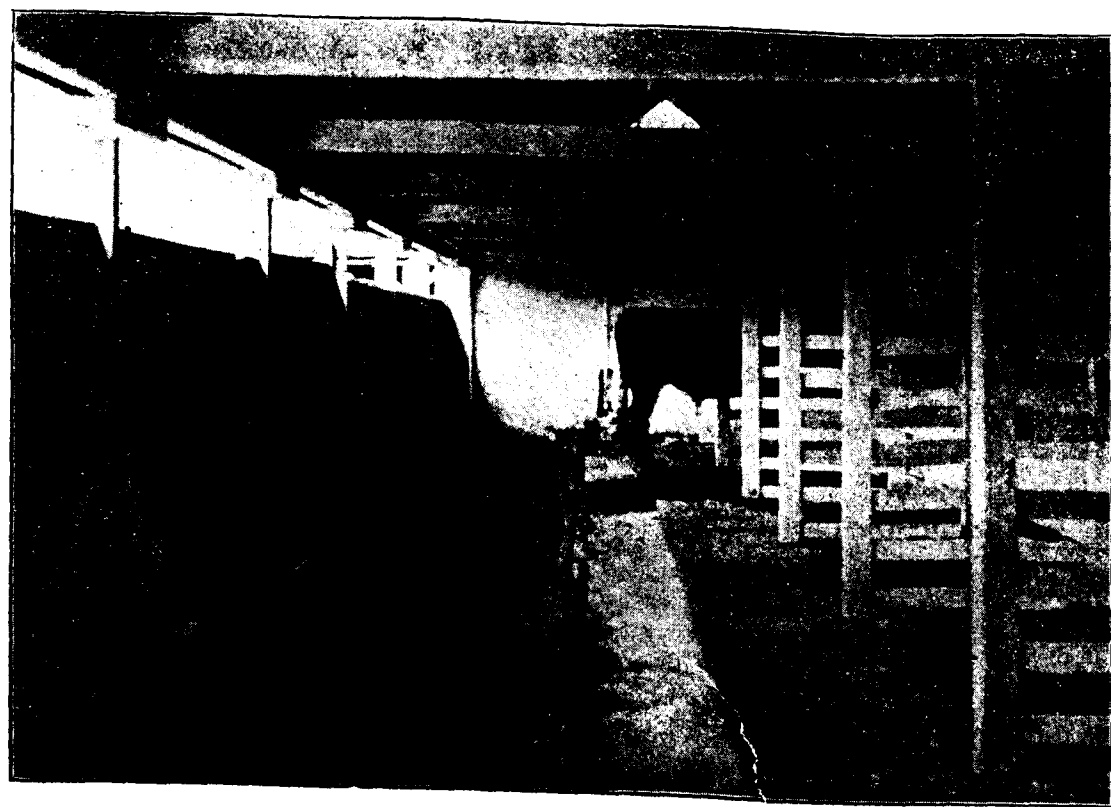
This enables the landlord to be made responsible for the larger structural alterations. As a matter of fact, we served our notices, which comprehended all the requirements, in duplicate, one copy upon the landlord, and one upon the tenant. Our structural requirements have been complied with in almost every detail, and the whole of this structural work has been paid for invariably by the landlord, and I doubt whether in any case he will get any return by additional rent. This, however, is a matter for arrangement between landlord and tenant. We told the tenant that he must see his landlord and arrange with him as to carrying out the work, with the foregoing result. The notices served were in the form of detailed specifications, notes of every item of work required to be done having been carefully taken upon the spot. You are not likely to successfully

convert an old cowshed by a general request to abate the nuisance and comply with the regulations. The exact requirements and mode must be specified, and the work keenly supervised from beginning to end by the inspector.

You may begin systematically by noting first the conditions outside the shed and afterwards proceed within. The shed fronts on to a yard, or on to an unenclosed space, roadway, open field or what not. There is the condition of the yard or other approach to the shed. Farmyards, the main object of which is to make manure, are on the whole dirtier now than they used to be, owing to the comparative want of litter; for since so much of the land went out of arable cultivation, litter has become correspondingly scarce, straw being in some seasons as dear as hay. The yards are, in consequence, often represented by a

found to be in a filthy state, the ground being usually soft, wet and deeply trodden, especially where the cows, converging to pass into the shed, all tread over the same ground.

The remedy here is draining, levelling and paving. The muck yard does not appear to be an asset of great value where the keeping of cows is the chief industry, and we have had the yards, such as above described, levelled up, though the carting of many loads of stuff has been required to accomplish this. Along the fronts of the cowsheds edging the yard we have asked for and obtained a durable pavement from 9ft. to 12ft. wide, and in one instance a small, but formerly filthy, yard has been levelled and paved all over with hard bricks. Where there was no enclosed yard we have obtained a hard paving of brick or concrete 12ft. wide along the whole front of the shed, the paved space being fenced from



In this shed, 18 inches removed from top of front wall, gives entrance to copious amount of air and light. The floor is brick; the 2-foot channel has concrete bottom with hard brick curbs.

quagmire of filth occupying a shallow excavation of greater or less extent. The manure from the cowshed is thrown out of the shed to form a long heap lying within a few feet of the front of the shed. When there is no yard, the approach to the shed will still be

the neighbouring unenclosed ground, by close paling, or strong post and rail fence; the approach to the pavement has also been made hard by putting down some loads of broken stone where the ground is liable to be trodden up. In this district it is very uncommo

to keep cows in a shed all day at any time of year, so that there is a daily driving in and out.

Inside the cowshed the first thing to look at is the floor, inasmuch as it is upon the floor that the excremental filth falls, afterwards to become plastered upon the cow's quarters. The conversion of the floor generally involves its entire reconstruction. It is made to an even durable surface of scored concrete or hard brick sloped to a channel 2ft. wide and 6in. deep, which runs down the whole length of the shed behind the standings for the cows, its nearer curb being not more than 6ft. from the nearest part of the manger. It is of the greatest importance that the distance from manger to channel be 6ft. at the utmost; 5ft. 9in. is sufficient with mangers at the ground level; but 6ft. from the ordinary elevated manger is ample for the largest shorthorns, and should never be exceeded upon any pretext. This requires to be strongly impressed because the farmer who is inexperienced in the use of the channel, amongst other objections, will be sure to complain that 6ft. is too narrow a space. The channel is slightly sloped from its sides transversely as well as in its length, to allow the fluid it receives to collect and run, and discharges on to a trap with a removable bucket to intercept solid material placed outside the shed at the head of the drain, which is to convey the drainage away to a cesspit situated so suitably in an adjacent field as to permit of its contents being readily applied to the land. At the head of the channel inside the shed there is a water tap with water laid on under pressure.

The questions of ventilation and of lighting come next. Cowsheds, upon being measured up, are found to be overcrowded, as a rule, when the regulations require 800 cubic feet per cow, and the sheds are often ill ventilated and very dark when the doors are shut, but all this admits of an extremely easy remedy. There is not the slightest necessity to keep cows in a shut-up shed at all. Cold does not hurt them, at least, not the degree of cold that is experienced at any time in the west and south of England. To box them up in the way commonly practised is a matter of the veriest prejudice, firmly established though that prejudice be. The best thing to do, therefore, is to take away the front of the shed, and when you cannot do this, to take away

a considerable portion of it, leaving large permanent openings to admit both air and light. Let no one trouble to put in glass windows, it is better to have free openings instead. Eighteen inches off the top of the front wall, be it of wood or brick, with openings in the gable ends immediately below the roof, or louvred ventilators upon the roof ridge of such size that their openings measure square feet rather than square inches, will make effective ventilation and let in ample light. In regard to overcrowding there is no difficulty in getting your 800 cubic feet when the measurement from before back, the front of the shed having been removed, reaches to infinity. Or the front wall of the shed may be taken down and rebuilt at a space of some feet beyond the eaves, leaving an unroofed area in front of the shed. Draughts are produced by small openings, especially when there is through ventilation by small openings. Draughts are prevented by having very large openings on one side, as by taking out the front of the shed.

Such alterations to cowsheds must be made before the cows come in for the winter, so that the circumstances of their dwelling may be the same from the commencement, no sudden change being occasioned, and the same cows should occupy the same stalls which, in fact, is the usual practice, and most cows, after being let out, will find their own stalls upon their return.

Of course such free ventilation has been objected to on the ground of loss of warmth, but oddly, the complaint, instead of being made on behalf of the cows, is now made on behalf of the milkers. The latter state that, on a frosty morning, they feel the cold very much whilst milking, but I suppose they will find a cure for this in the wearing of a thick jersey or undercoat.

The water supply to the cowshed is often a matter of more serious difficulty. In all instances the supply requires to be investigated, its source ascertained, an estimate made as to the likelihood of its pollution, and the quality of the water ascertained by chemical and bacteriological analysis. There should be a pure supply for the cows to drink, and a supply of water under pressure to wash down the channel twice a day at least, after the solid manure has been picked up and removed in a wheelbarrow to a sufficiently distant muck heap. Some thought and search will usually

discover an available means of water supply to the cowshed, whether from a spring by gravitation, from a lower source by means of a ram, or by an extension of a public service when the shed is within or near an urban area; if it must come from a well, a force pump and elevated tank will be required.

DISCUSSION.

Dr. BOSTOCK HILL thought that it was imperative that in the production of milk, above all other things used as food, owners and producers should be taught to understand that the utmost cleanliness was necessary. The fouling of the bodies of the cows was generally due to the stands being made too long. He was doubtful as to the effect of cold on the cows. He carried out some experiments on this matter a few years ago, and he had grave doubts as to whether as much milk would be produced in cold sheds. Undoubtedly a sudden cold snap would alter the quality of the milk so far as the fat was concerned in the morning supply. He thought that the importance of ventilation of sheds should be urged in annual reports. He drew attention to the importance of cleanliness in the hands and clothes of the milkers.

Dr. ROBERTSON criticised the dimensions given by Dr. Garrett as to the length of the stands. He preferred to measure the complete stand from the rail behind the manger rather from the head of the trough; this would give a 7-feet 6-inch stand, which was the best stand for a large sized cow; for smaller cows, like Kerry cows, a shorter stand was sufficient. He did not think that an all brick or an all concrete stand was at all necessary. If the rear part were brick or concrete, that was sufficient, the front portion being hard beaten clay; he was not sure whether wood was admissible. He pointed out the differences he had noted in the construction of sheds in Belgium, Holland and Germany. He was quite satisfied that when cows were kept in a cold atmosphere they gave very good results indeed. The Agricultural College in Shropshire kept a herd of cattle under open air conditions, and a similar herd of cattle under warm shed conditions. At the end of the first year the result was as good in the one case as in the other. After another four years' observation the results were published, and it was found that there was practically no difference between them so far as the quality and quantity of the milk were concerned. He thought that it was better to have a large number of small ventilators than two or three large ones.

Dr. SNELL complimented Dr. Garrett on the improvements which he had been able to effect in Cheltenham cowsheds. He was of the opinion that if cowsheds could be rendered really healthy, well ventilated buildings, tuberculosis amongst cows would disappear, and the problem of dealing with tuberculous milk would not exist.

The PRESIDENT (Dr. Reginald Green) detailed the work that had been done at King's Norton in the matter of improvement of cowsheds.

Dr. GARRETT replied briefly on the points raised

in the discussion. He thought that if cows were taken from a closed to an open shed there was a loss of milk. Farmers always declared that when cows were shut up there was a loss of milk. He did not think wood a suitable material for the fore part of the stand. He had always found that ventilation by small openings produced draught; that condition was cured by having much wider spaces, so as to produce a condition as much like the open air as possible.

MIDWIVES ACT.—At the Central Criminal Court, before the Recorder, on January 15th, Jane Emily Inglis, a nurse, was indicted for procuring a certificate of admission to the Midwives Roll by a false certificate. She pleaded guilty. It was stated that this was the first case under the Midwives Act. The prisoner practised as a nurse at Bradford, and she induced a local medical man to give her a certificate which stated that she was trustworthy and sober, and as a result she was placed on the Roll of Midwives. Afterwards it was discovered that in 1892 the prisoner had been tried for murder and was sentenced to penal servitude for life for performing an illegal operation which ended fatally. This sentence was commuted to three years' penal servitude. Subsequently she had been charged with a similar offence and acquitted. The local doctor said he had given the certificate without knowledge of these facts. She had been introduced to him by a deceased assistant, and since he knew her, her conduct had been such as to justify his certificate. Sentence was postponed until the February Sessions, when she was sentenced to twenty-one days' imprisonment from date of conviction.

BISCUITS UNFIT FOR FOOD.—At Old Street police-court on January 21st, Thomas Saunders, trading as Saunders Brothers, wholesale and retail grocers, Linchouse, was summoned at the instance of the Bethnal Green Borough Council for having in his possession for sale, and intended for the food of man, a quantity of biscuits which were unsound and unfit for food. It was stated for the prosecution that certain children were taken ill after eating broken biscuits sold at a shop in Bethnal Green at 2d. per lb. Their mother, attracted by the sweets she had noticed on the children's biscuits, sent for some for herself. Having tasted one, she found it bitter, and on examining the remainder found them maggoty and unfit for food. She sent the biscuits back to the shop, and the manager returned the money, and threw the biscuits back into the box, remarking, "What can you expect for 2d. a lb.?" The woman purchased some more and sent them to the sanitary inspector. At the shop 180 lbs. of biscuits in a similar state were found, and the medical officer of health pronounced them unfit for food. For the defendant it was said that the shops were regularly inspected and bad food condemned, and that the shop manager had orders not to sell such goods. He was fined £40 and 21s. costs.

THE WATER SUPPLY OF DAIRY FARMS.*

By A. E. PORTER M.A., M.D., D.P.H.,

Medical Officer of Health of the Reigate Rural District.

THE object of these meetings is, I take it, as much for the purpose of exchanging ideas and obtaining assistance as for giving information on any branch of our work in which we happen to be specially interested, and I am very glad to have an opportunity of ventilating a subject which has been exercising my mind for the best part of a year, namely, the degree of purity desirable in water supplies of existing milk farms.

As regards buildings newly occupied, the powers of a local authority are fairly ample, since, not only is a cowkeeper required to give a month's notice of his intention to begin to occupy a new shed, but also he must first make provision to the reasonable satisfaction of the local authority for a proper water supply. If the former requirement is known and enforced, no intending cowkeeper is likely to contemplate the erection of new sheds unless he is fairly certain that the water will be sufficient both in quantity and quality.

There are, however, probably few dairy districts where this section of the Order has been sufficiently enforced in the past, and those of us whose work lies in such a district, are faced with the difficulty of advising our authorities as to which farms are unsatisfactory in this respect, and as to what steps can and should be taken to improve matters.

Section 8 of the Dairies Order is fairly clear on this subject, stating that the supply shall be such as is necessary and proper (a) for the health and good condition of the cattle, and (b) for the cleanliness of milk vessels, and (c) for the protection of the milk against infection or contamination.

Ample though the powers may appear to be, those of us who are in charge of rural districts have to face the fact that a large number of farms rely on wells which, on analysis, would be at once condemned as unfit for drinking purposes, whilst many others would be classed as being of doubtful purity.

Unless we adopt the attractive policy of letting sleeping dogs lie, we have first to make up our minds as to what degree of pollution is sufficient for us to advise our authorities to

insist on a purer supply, and, having solved this problem, we probably find that in some instances there are no reasonable facilities for obtaining a supply that shall be above suspicion. If water mains run through the district it is necessary for someone to decide what constitutes a reasonable distance from which a cowkeeper can be required to lay a service pipe. Opposition on the part of the cowkeepers certainly, and on that of the local authority possibly, can be anticipated if our activities are too pronounced, and it is, therefore, probably a wise policy to take as lenient a view as is compatible with the public safety. It is on subjects such as these that I should be grateful for the opinions of the Branch, and, having briefly stated such facts as I have been collecting for some months, I propose to ask for your views on certain specific points.

In all, there are about 100 dairy farms in my rural district; forty-four of these rely partially or entirely on well water, three more on rain water tanks, and one on piped pond water. So far, I have had samples from thirty-four of the supplies, and have examined them bacteriologically. Wherever the result has been unsatisfactory, I have examined the sample chemically as well.

The standards that I usually adopt for well waters are sufficiently lenient. When a considerable number of samples have to be examined in the small amount of spare time available, the quickest and most convenient methods are necessary, and I put 1 and 10 cc. respectively into tubes of McConkey's bile-salt glucose broth in the first instance. If acid and gas is produced, I plate the lowest dilution showing this change on bile-salt lactose neutral-red agar, and apply the so-called "flaginac" test to likely colonies, and also grow the organisms on gelatine for a couple of months. At the same time I test 500 cc. of the water for *Bacillus enteritidis sporogenes*. One ought also, I suppose, to search for streptococci, but I do not. A sample that contains flaginac bacilli in 10 cc. or less, and also *B. enteritidis sporogenes* in 500 cc., I regard as unfit for drinking purposes, and more especially so if *B. coli* is present in 1 cc. If there is no evidence of *B. enteritidis sporogenes*, but *B. coli* is present, I look upon the water as being of a suspicious character, especially if *B. coli* is present in 1 cc. If the McConkey medium is unchanged, I consider the water to be reasonably pure,

*Read at the Meeting of the Home Counties Branch of the Society of Medical Officers of Health on November 19th, 1908.

unless *B. enteritidis sporogenes* is present in 500 cc., when the sample is labelled doubtful.

As regards chemical standards, I consider that a reasonably pure well-water ought to contain less than 0.005 parts of free ammonia, and 0.01 parts of albuminoid ammonia per 100,000 nitrates, and the amount of nitrites, are taken into consideration, but the chlorine figure in my district is too variable to be of much service. I do not often estimate the oxygen-absorbed figure. It seldom, if ever, gives a more valuable indication than the albuminoid ammonia, and iron is frequently present in the samples as they reach me.

On this basis, of the thirty-four samples, four only can be considered as pure. Eighteen are bad bacteriologically, and twelve doubtful.

Of the eighteen bad samples fifteen are bad, two good, and one doubtful on a chemical basis. The question arises—should a supply be condemned when the chemical examination is satisfactory, on the bacteriological result?

Of the twelve samples of doubtful bacteriological purity, six were bad, four good, and two doubtful chemically. The question now arises—should a supply be condemned because the chemical results are bad, when complete evidence of pollution is not forthcoming bacteriologically?

To save complications, I will omit from consideration the samples which are doubtful, either chemically or bacteriologically, but passable on the other basis, and will assume that the twenty-four samples that are bad in one or both respects, would be condemned as unfit for drinking purposes. A further question now suggests itself—are these twenty-four supplies also unfit for dairy purposes? In only two of them is there any obvious source of pollution of human origin, and in the remainder the probability is that the pollution is derived ultimately from the sheds or manure yards, with the exception of the three rain-water tanks, where the collecting areas are no doubt at fault, and of the piped pond-water supply (bad chemically, and only *doubtful bacteriologically) where the organic matter is presumably derived from the surroundings.

It will probably be submitted that a water supply contaminated by the drainage from cowsheds is totally unfit for washing cans and similar purposes, and personally I agree, but I can imagine a defence that might succeed in a Court of Summary Jurisdiction, namely

that milk, collected in what must be considered as at least a moderately cleanly manner, on a farm, the water-supply to which is above suspicion, invariably contains bovine foetal bacteria in abundance, and that the minute number of such organisms that can be introduced into a can or churn, which has been simply rinsed out with water slightly polluted by cowshed drainage is of little if any moment. That the first proposition is correct is an undoubted fact. Houston suggests as a standard of clean milk a sample containing not more than 1,000 specimens of *B. coli* per cc., or more than one spore of *B. enteritidis sporogenes* in the same quantity. Dr. Orr, in an extended series of observations in Yorkshire found that 77 per cent. of samples of milk taken at the cowsheds contained one or more *B. coli* in 1 cc., 35 per cent. contained ten or more, and 18 per cent. contained 100 or more specimens of this organism in the same quantity. His suggested standard is ten members of the *B. coli* group per cc. He found that 75 per cent. of the cowshed samples contained *B. enteritidis sporogenes* in 10 cc.

In some experiments in connection with a clean cooled milk supply in Leeds, we found that 24 per cent. of samples as taken from the cow in a specially selected dairy contained ten or more organisms of the *B. coli* group per cc.

With these facts before us, it is obvious that the number of foetal organisms introduced by the rinsing out of pails and churns and the cleansing of cows' udders and milkers' hands with water polluted by cowshed drainage is comparatively negligible in a numerical sense, and, unless it can be proved that the virulence of such organisms is increased by passage through the soil, or storage in a cesspool or well, it seems to me that the defence might be accepted by a magisterial bench. The only obvious answer that suggests itself to me is that without a pure water supply, a pure milk supply is impossible, an answer that might or might not be convincing. If the water is contaminated by human sewage, the matter is, of course, a different one.

Another point that I wish to raise is, assuming that the supply is unfit for dairy purposes, what is to be done if there is no obvious prospect of getting a better one? If the mains of a public company run near the farm, the solution is an easy one; but, even in the few rural districts so favoured, the nearest

main may be half-a-mile, a mile, or even further away. On a sandy or gravelly soil, a new well, protected from surface washings, and rendered watertight for the upper fifteen or twenty feet, would presumably yield a water from which most of the sewage organisms had been removed by filtration; but what is to be done in the case of a farm situated on a soil like the Weald Clay, which obtains in the greater part of the district I am considering? Firm pressure will probably result in the farm being closed for dairy purposes, and few rural authorities will be parties to such a procedure. One great difficulty arises from the fact that the Dairies Order throws the responsibility on the occupier, and not the owner, and a large proportion of the farms in my district are held on short leases.

The following two instances may serve as examples:—

No. 1.—A farm of thirty to forty cows, situated on the Weald Clay, fully half-a-mile from a water main, supplied from a well close to the yard round which the sheds are built. The water contains: free ammonia 0.01, albuminoid ammonia 0.03 parts per 100,000, and a large trace of nitrites. *B. coli* is present in 1 cc. and *B. enteritidis sporogenes* in 500 cc. The sheds themselves are well constructed, lighted and ventilated, and have recently been redrained.

No. 2.—A farm also situated on the Weald Clay, 1,400 feet from a water main. Twenty-six cows kept. Supplied from a well about 100 feet deep, and thirty yards from the sheds. Free ammonia 0.03, albuminoid ammonia 0.004, nitrates 1.1 per 100,000, a heavy trace of nitrites. *B. coli* in 1 cc., *B. enteritidis sporogenes* in 500 cc.

Both farms are held on three-yearly leases, and neither of the owners are wealthy. The chances of procuring a suitable supply of water from a new well at any spot conveniently situated would be doubtful, and, under such circumstances, the owners would probably prefer to let the farms for breeding or grazing purposes only.

With your permission, I will now recapitulate the points that seem to me to be of chief practical importance in the form of questions:

1. Is a water supply that shows material signs of pollution, of bovine origin only, necessarily unfit for dairy purposes?
2. If so, should the water be condemned

on the chemical results alone, complete evidence of pollution bacteriologically being absent?

3. Similarly, should the water be condemned on the bacteriological finding, the chemical results being within the limits of a potable water?

4. Assuming that the water is unfit for washing out cans, etc., is it also unfit for cooling purposes? The temperature of a well water in summer is often below that of a public supply, and there is a considerable saving to the farmer, who pays for water by meter.

5. What is to be done in the case of farms, for which there is no better supply reasonably available? What, for instance, may be taken as a reasonable distance from a water main to which the occupier may be required to connect? Farms outside such a distance would presumably be left alone if there were no prospect of improvement in other ways. In connection with Sec. 62 of the Public Health Act, 1875, I believe that the Local Government Board have decided that a quarter of a mile is a reasonable distance.

In taking action that may lead to the abandonment of a farm, the importance of the dairy industry to a rural community must not be lost sight of.

6. Finally, what degree of purity is essential for the health of milch cows, and for the quality of the milk they produce? I have put this last because I am without any information on the point. The average farmer will tell you that cows prefer a stagnant pond water to the finest filtered public supply, and they certainly appear to flourish on beverages that would be condemned by any analyst. Are the bacteria they imbibe excreted in the milk, and do they lose such virulence that they may possess in the process?

The only reference that I can remember to have seen bearing on the subject is from the *British Medical Journal* of as old a date as 1880. A household of a Yorkshire village, ten in number, had lingering illnesses of a typhoid character. They kept their own cow, and her water supply was from a stream into which a water-closet discharged. The cow had had a tedious illness accompanied by wasting. As soon as the cow was sent away the illness in the house stopped. This is, of course, very vague, and does not indicate what is likely to happen when a cow drinks water

polluted by farm drainage. Theoretically, no doubt, a cow ought to have as pure a water as is possible, but even in farms where the general supply is above suspicion, any source seems to be considered good enough for the unfortunate animal.

The points I have raised have been in my mind for a considerable time, and I have not as yet managed to find a solution which gives me entire satisfaction. Consequently I shall be very grateful for any views which will throw light upon them.

POLLUTED OYSTERS.—At the Mansion House on February 15th, William Henry Gunn, of Hillside, Malpas, Truro, was summoned for being the owner of 1,000 oysters exposed for sale in Billingsgate Market, which were unwholesome and unfit for human food. The defendant pleaded "Guilty." Mr. Muskett, solicitor, who prosecuted on behalf of the Fishmongers' Company, said this was the second case of polluted oysters dealt with in that Court during the last two months. Last year the Company stopped the sale of oysters from the Falmouth and Truro districts, as the Truro river had become grossly polluted with the sewage of that city, and the oysters taken from the river proved, on bacteriological examination, to be dangerously unwholesome. Afterwards oysters from Lamouth and Coombe Creeks were allowed to be sold, as they were not infected. The defendant was found dealing with oysters not emanating from either of these creeks and sending them to London for sale. He had written to a salesman saying that, as he heard there was a little complaint, he must, if asked, say they came from Coombe Creek. Of these particular 1,000 oysters all were detected and destroyed, Dr. Klein's examination of twelve samples showing they were gravely polluted. At the same time 9,000 other oysters found elsewhere at Billingsgate and coming from the same locality were condemned and destroyed. The Company had no wish to press for a severe penalty, but the defendant admitted that he had been sending away 4,000 or 5,000 oysters per week. He was in a small way of business. Mr. Davey said his client regretted what he had done and would promise not to offend again. The Lord Mayor said the community ought to feel indebted to the Fishmongers' Company for their action in the interests of the public health. He fined the defendant £50 and £10 10s. costs, with the alternative of two months' imprisonment.

MILROY LECTURER FOR 1910.—Mr. G. R. Foulerton, F.R.C.S., D.P.H., Medical Officer of Health to the East Sussex County Council, and lecturer on bacteriology and public health at the Middlesex Hospital Medical School, has been appointed Milroy Lecturer to the Royal College of Physicians for the year 1910.

WATER SUPPLIES ON DAIRY FARMS.*

By H. DROOP RICHMOND, F.L.C.,
Chemist to the Aylesbury Dairy Company, Ltd.

IN the course of my ordinary duties I have to examine the water supplies on the farms from which the Aylesbury Dairy Company draw their supplies of milk.

The system adopted is briefly as follows:—When a farmer wishes to supply the Company, he fills up a form giving *inter alia* particulars of the water supply; if these particulars indicate that the supply is likely to be suitable, the farm is inspected on behalf of the Company by the medical officer of health for the district in which it is situated, whose report contains his observations as to the character and position of the supply or supplies, and the likelihood or otherwise of contamination. The medical officer of health takes samples of the water for chemical and bacteriological examination, which are forwarded to me. In the event of the water supply being passed, particulars of the water are entered in the contract, it being specified that no other water may be used under heavy penalties in the case of breach; samples of the water are regularly taken half-yearly so long as the contract continues. If the water is condemned, and no other good supply can be obtained within a reasonable space of time, no contract is of course made, and the farm is rejected. In many cases it happens that a new supply is easily available, and in others that there is more than one supply on the farm, one being passed and the other condemned; in these cases the condemned supplies must be cut off, if they are sufficiently near the dairy to afford any possibility of their being used.

In the table of statistics that follows, the column "Good" refers to farms which have only water supplies that have been passed; the column "Bad" refers to farms on which no good water was available, and which were consequently rejected; while the column "Good and Bad" indicates those farms on which a good water was found after the first supply had been condemned, which was subsequently cut off.

On looking through my books I find particulars of 278 dairy farms, on which there are altogether 447 water supplies; of these, 146 farms with a total of 210 water supplies

*Read before the Home Counties Branch of the Society of Medical Officers of Health on November 19th 1903.

were passed, 86 farms with 113 water supplies were condemned and entirely rejected on this account, while 46 farms were found at first to have altogether 75 polluted supplies, which were cut off, and a total of 49 new good supplies were found on these farms.

The table below gives the farms arranged according to the counties in which they are situated:—

County.	Good.	Bad.	Good and Bad
Bedford ...	1 ...	— ...	—
Berks ...	7 ...	7 ...	7 (1)
Bucks ...	4 ...	4 ...	1
Cambs ...	— ...	1 ...	—
Cheshire ...	41 (29) ...	10 ...	10 (7)
Derby ...	3 ...	5 ...	1
Essex ...	2 (2) ...	— ...	1 (1)
Gloucester ...	3 ...	1 ...	—
Herts ...	3 ...	— ...	—
Leicester ...	2 (2) ...	2 ...	—
Middlesex ...	1 ...	— ...	—
Notts ...	— ...	2 ...	—
Oxford ...	3 ...	2 ...	—
Shropshire ...	1 ...	8 ...	—
Somerset ...	18 (10) ...	2 ...	2 (1)
Stafford ...	3 ...	5 ...	—
Surrey ...	1 ...	— ...	—
Sussex ...	— ...	— ...	1
Warwick ...	— ...	1 ...	—
Wilts ...	53 (16) ...	36 ...	23 (3)
Total ...	146 (59)	86	46 (13)

The figures in brackets give the number of farms supplied with water from public mains; it is seen that there are 72 farms thus supplied, chiefly from the Liverpool mains in Cheshire, and the Trowbridge mains in Wiltshire.

Excluding the public supplies, and taking only wells, springs, etc., into account, I find that I have been able to pass 187 water supplies, while I have condemned 188. This indicates that 50 per cent. of the waters on farms are polluted.

From a public health point of view it is a matter of satisfaction that the examination of the water supplies on farms has resulted in the finding of new and good supplies on 46 farms, and the closing of the polluted wells, etc.; the total rejection of 86 other farms by the Aylesbury Dairy Company is, however, less satisfactory, as it simply means that the milk is supplied to the public through other channels where less attention is paid to the purity of the water supply.

In my experience the difficulty of finding a new supply on a farm on which the usual supply is found to be polluted is not very great, except when the underlying formation is clay; on many farms there is a stratum of

gravel overlying the clay, which yields abundance of water, but this is almost everywhere polluted (my experience is limited to the London, Kimmeridge and Oxford clays, but doubtless the remarks apply to other clay formations). By going to the strata below the clays, often at a considerable depth, it is usually possible to obtain unpolluted water, but these are often highly charged with salts—sulphates, chlorides, and carbonates—to such an extent that they are not desirable as potable waters. On other formations, such as the chalk, the upper and lower greensands, the oolites, and the new red sandstone, it is usually possible to find good water at a reasonable distance from the farm and at not too great a depth. My experience leads me to consider that the importance of making the upper portion of the well water-tight is not generally appreciated, and that frequently the protection of the top of the well is neglected. In at least two instances I have seen the well covered with loose boards over which the men walked, and the pump so placed that the drippings from the spout washed the filth from their boots back into the well.

As instances of imperfect sides to the well, I may mention a case in which a well sunk through clay usually yielded good water, but in a season of drought was polluted from a cesspit thirty yards away owing to the cracks in the soil as it dried; another well which yielded water containing twenty-three parts of chlorine per 100,000, was in times of heavy rainfall contaminated by surface water of much lower chlorine content, the contamination being first indicated by a low chlorine; a third well which suddenly became polluted owing to the breakage of an unknown drain which ran within a very short distance; while a fourth instance is afforded by a well which became polluted whenever a cesspit, some distance away, and at a slightly higher level, became too full.

In every case a well should be cemented right down to an impervious stratum, and the sides brought up above the surface of the ground; it should be provided with a dome-shaped or conical cover.

With reference to the points raised by Dr. Porter in his paper on this subject, I am of opinion that as much attention should be paid to the water used for cooling as to that used for cleansing dairy utensils; it is by no

means uncommon when inspecting milk coolers to find a small leak either in the cooler or the water connections from which small quantities of water insufficient to be discovered by analysis of the milk may find their way into the milk.

When the bacteriological examination shows pollution while the chemical analysis is good, and *vice versa*, the supply should, at all events, be very carefully inspected, if not at once condemned; in one case the bacteriological results were so suspicious after twenty-four hours (turbidity in Parietti broth, which I then used, and sporogenes-like curdling of milk) that, notwithstanding a good chemical analysis, I telegraphed to have the well opened, and a small recent leak was discovered. In another case the chemical results were very bad, but the water was nearly sterile; on inspection the position of the well it was found to be hopelessly bad, and a later bacteriological examination was less favourable; in this instance it appeared that a quite unreliable filtration through the soil was going on.

I am of opinion that pollution from the drainage of cowsheds should be regarded as dangerous; I have seen so many instances during my visits to farms in which persons employed on the farm have relieved the calls of nature in the cowsheds, that for this reason alone I should condemn such a water.

With regard to the other two points, I would only mention that I know of two instances where water is brought in pipes for over one mile, and that I can confirm the extreme difficulty often mentioned by farmers of preventing cows from drinking from any dirty pool rather than from a good water supply.

TWENTY-NINE YEARS' SERVICE AS MEDICAL OFFICER OF HEALTH.—On January 1st, Dr. Joseph Henry, J.P., relinquished his office as medical officer of health of Rochdale, an office he had held continuously since October 30th, 1879. At the last meeting of the health committee he attended, Dr. Henry submitted a report in which he reviewed the improvements in the health and sanitary condition of Rochdale during his twenty-nine years of office. In this period the birth-rate had fallen from 35.6 to 23.8, the death-rate from 25.3 to 17, the phthisis death-rate from 2.4 to 1.28, and the infantile mortality from 176 to 121. On his retirement, Dr. Henry was presented with a silver tea and coffee service by the members of the health committee, and with a silver loving cup by the staff of the Marland Hospital.

THE EAR, NOSE, AND THROAT IN SCHOOL MEDICAL INSPECTION.*

By P. MACLEOD YEARSLEY, F.R.C.S.,
Senior Surgeon, Royal Ear Hospital.

IN your capacity as School Medical Inspectors you will have it in your power to do much toward the prevention of ear disease and, by the detection of incipient deafness, you will be able to arrest its further progress by ensuring appropriate treatment. The enormous importance of perfect hearing in the intellectual and moral development of children, and the serious handicap to them of moderate or even slight degrees of deafness, will become very patent to you after you have spent a short time at your duties, and you will quickly find that the prompt recognition of imperfect hearing is not the least of your responsibilities. Before we turn our attention to the inspection of ears, nose, and throat, it will be well, therefore, to consider what the possession of normal hearing means to the child's education.

The primary and most simple idea of an object is formed by the revival in the mind of the impression that the object has made upon the sensorium through the sense organs, and each percept or idea of an object is the complexus of images received through the different senses—sight, smell, hearing, taste, touch, and the muscular sense, some one of these being usually the "master sense." The blending of these sensory ideas is probably due to the presiding intelligence, which belongs to the cerebral cortex as a whole. As education proceeds, and language is developed, each object percept becomes related with its name, these names being the verbal symbols of the simplest ideas which we have of things.

In the language of a nation, certain articulate sounds become the symbolic representatives of certain definite ideas, learned by each child first as sounds, later as symbols. *The sounds are first registered in the cortical centre for hearing*, and it is under the guidance of this centre that the child trains the motor centre to articulate the sounds, thus getting second images imprinted upon the cortical motor centre for speech. The motor reproduction of sound becomes so interesting that the child reproduces many sounds by *echolalia*, without

* Lecture delivered at the Rooms of the Society of Medical Officers of Health, January 12th, 1909.

attempting to understand them. Before *echolalia* is exhibited, however, the child obtains a number of word-memories imprinted upon the auditory centre before he can articulate a single one of them, and these are even associated with their proper meanings. At this stage the education of the receptive apparatus is ahead of that of the reproductive motor apparatus.

This very short statement will serve to demonstrate how much depends not only upon the auditory receptive apparatus, but upon the integrity of the channels—the auditory conductive apparatus—which carry the sounds to it.

When there is any defect of hearing the development of speech suffers, and with it the mental development of the child. The sensations which give rise to hearing consist practically of two elements—*tone* and *noise*, both of which possess the qualities of pitch, intensity, and timbre. From the multitude of sounds which surround the child, the most important to him is *speech*. Speech ranges through some three octaves, from C (128) to C² (512). In order to appreciate how defective hearing affects the education of the child, we must recognise what escapes him. He is unable to perceive noises of slighter intensity, such as the softer sounds of the wind and the chirping of insects; and as it is these sounds of slighter intensity which go to form the "Voices of Nature," he loses much of the education which the natural world would otherwise afford him. He cannot distinguish the sounds of wood and countryside, and he loses also to a large extent the finer shades of human vocal expression. The hard of hearing child not only hears less than his normal fellows, but he also hears differently to them. His intellectual development consequently suffers, for, since all perceptions originating from soft sounds are wanting, a great defect in conceptions follows. Such a child does not know why a noise is at one time called humming, the next time murmuring, or singing, buzzing, etc. Many conceptions are also rendered incomplete; for instance, in "watch" the part represented by "ticking" is absent; with the idea of "bees" buzzing may be wanting, and so on.

But besides this, the important development of speech suffers in direct proportion to the degree of deafness and the period of its onset, many of the speech-sounds not being heard,

or being heard in an altered tone. As a result, speech is slowly learned, or various errors of speech appear, the child slurring consonants, which are either not heard or heard in an altered form. A poor comprehension of speech and its delayed development has the further result that the chief stimulus of thought—conversation with those older than himself—is partially absent. Consequently such children are sufficiently handicapped to be poor at their lessons, thus gravitating to the bottom of the class; they are less developed mentally, and the gap between them and their classmates becomes accentuated as their school life goes on. Even those who suffer from deafness in a minor degree feel their defect, and their mental development is influenced for the worst. These children are sometimes noticed by their teachers as "inattentive"—they are usually the children with adenoids and naso-pharyngeal catarrh. Such cases are easily fatigued and vary with the state of the weather. Damp and rain increase their nasal obstruction and accentuate their defects of hearing. If such children are punished they are frequently unaware of the reason, and, being generally shy, without much self-reliance, and often awkward of speech, punishment merely frightens them and renders them less easy to manage. You should be on the alert for such cases, and teachers cannot be sufficiently warned that children who make little progress and are inattentive should be presented for medical examination before they are put down as refractory.

There are, therefore, several very cogent reasons for exercising a special care of the ears, nose, and throat in school medical inspection, and you will probably wish to know the best and speediest method to pursue. It is wiser to make a routine examination of these regions before you examine functionally the hearing, as then your time is not wasted in testing children whose ears are obstructed by wax or discharge. Accumulations of cerumen or discharge should be removed by proper syringing and the ears again inspected to ascertain the condition behind the accumulation. All cases of discharge should be noted, and directions given for the parents to be communicated with in order that the child should have prompt treatment. The dangers of ear discharge should be impressed upon the parents, if they

are present, or the teacher should be instructed to inform them. Children whose parents persistently neglect treatment should, I think, be excluded from school, after the parents have been warned, and steps taken to enforce proper treatment. You should take note of such cases and make sure that adequate treatment has been carried out. When there is an otologist attached to the school it is better that all cases of discharge or other ear conditions should be referred to him, as you are then relieved of much responsibility.

The nose and throat should also be examined, especially with a view to the detection of enlarged tonsils, adenoids, and nasal suppuration. Time will not permit of our considering in detail the nasal conditions that may be found, but some attention must be given to the question of adenoids. I do not think there is any necessity for you to feel for adenoids with the finger behind the soft palate. An inspection of the pharynx and fauces with the tongue properly depressed is, combined with careful note of the symptoms, sufficient for all practical purposes, and if you make it a practice of palpating every case, you will soon become an object of fear and suspicion to the children. The small wooden tongue depressors used in the London County Council schools are most useful, as they can be burned after use. Very often you can see an adenoid mass by merely depressing the tongue strongly; and it has been pointed out that adenoids are frequently accompanied by large granules (much larger than the granules of an ordinary granular pharyngitis) on the posterior pharyngeal wall. Of the symptoms which help you to diagnosis, the frequent catching of colds is the most important, the next in order being mouth breathing, adenoid face, adenoid speech, ear complications, and aprosexia. It is worth while pausing here for a minute or two to consider some of the effects of adenoids upon the mental condition of the child, apart from the difficulties to which concomitant deafness may give rise. The condition to which Guye, of Amsterdam, in 1887, applied the term aprosexia is given by various authors as occurring in from 35 to 70 per cent.—a wide margin. In a recent investigation, the particulars of which I hope soon to publish, I found aprosexia present in 73 of the 1,562 children examined, or 1 in 21.41, and all of these had adenoids. In an analysis of 307 consecutive cases of adenoids

made in 1901, the symptom was marked in 17, or 1 in 18.05. In all these the nasal obstruction was severe. Crowley found aprosexia present in 28 per cent. of his cases, and considers that in many instances the mental dulness is more apparent than real, the true cause being the deafness. The deficient mental condition consists chiefly in a want of concentration, and any effort in that direction appears to exhaust children with marked adenoids in a very short time. It is probably due to the combined effects of deficient blood oxygenation and a hindrance to the cerebral hæmic or lymphatic circulation. It will generally be found that, apart from aprosexia, the effects of adenoids upon the temper and general disposition of the child are very noticeable. Many adenoid children are fretful, sulky, or liable to outbursts of passionate temper, and difficult to manage. I have known children to change markedly in this respect after an operation. The blood changes are important in regard to aprosexia. Lichwitz and Sabrazes found that children with adenoids have a mild form of anæmia and leukaemia, with an increase in the large mononucleated cells, viz., the lymph cells and eosinophiles, taken by the percentage method and by absolute count per c.mm., and a relative and absolute decrease in the number of polynucleated cells. After the removal of adenoids they found that the blood tends to return to the normal.

Of the importance of removing adenoids and enlarged tonsils there can be no doubt. It must be remembered that the children in State schools are exposed to a much worse environment than are the children of the better class, and they must have every possible handicap removed. The relation of adenoids and enlarged tonsils to tubercle, their effect upon the nose and ears, the shape of the chest, and the unfavourable influence they exert should the child suffering from them contract diphtheria, measles, scarlet fever, or other exanthema, as well as their effects upon the mental condition and blood state, are all very strong reasons for their proper and efficient removal. Whilst upon this subject I may point out two facts that are not generally known, or, at any rate, generally appreciated. The first is that very large tonsils may sufficiently block up the pharynx to cause mouth breathing, without the presence of adenoids; this was particularly brought home

to me when I met with a child in an elementary school in which mouth breathing persisted after the removal of adenoids, and in whom I found a pair of enormous tonsils so enlarged that air could only reach the lower air passages *via* the mouth. Their removal restored the child at once to nasal breathing. I recently also operated upon an adult, in whom there was mouth breathing without any nasal obstruction; she had two greatly hypertrophied tonsils which caused very considerable pharyngeal obstruction, and she could, in consequence, only breathe with any degree of comfort through the mouth.

The second fact is the frequency of enlarged tonsils and especially of attacks of tonsillitis in connection with carious teeth. This is, of course, a phase of oral sepsis, but I do not think the influence of dental caries in the causation of tonsillitis has been sufficiently recognised.

I now pass on to the consideration more especially of hearing defects. Defects in hearing in school children will be found to vary from slight departure from the normal to severe deafness, causing partial or complete mutism. The methods at disposal for testing the hearing are the watch, the bell, the voice, the Galton whistle, and the tuning-fork. Of these the watch should be discarded as misleading and useless. The tick of a watch is a complex of musical sound and noise, and some deaf persons will hear the former whilst others hear the latter; moreover, every watch varies in its tick according to the condition of the winding, and some watches tick more loudly than others. The bell is required only for the very deaf, and it should have its clapper fixed by a spring to the outside of the bell, in order to give a single stroke. The usual form of Galton whistle sold is unreliable, and, for motives of accuracy, it is best to use the Edelmann-Galton pfeife. It is required for testing the acuity for high sounds. The most useful tuning-fork to use is that known as Lucae's, provided with a vulcanite foot, and clamps to prevent overtones. The "Gardiner-Browne" fork is misleading. A C fork, of 128 double vibrations per second, should be employed; a stop-watch should be at hand to register the difference between the child's bone-conduction and that of the examiner (presumed to be normal).

But the functional testing of the hearing takes time, and when the medical inspector

has to examine a large number of children he cannot do more than detect those who are deaf, and either retain them for further testing, or refer them to an otologist. I am of opinion that consulting otologists should be appointed for this purpose. Of all the tests for hearing, that of *speech* is the most important, and therefore, the one to be relied upon for the medical inspection of school children. The tests should be applied in the presence of the teacher, who may be able to give the doctor important information about the child. A normal child's ear can hear whispered speech easily at from 20 to 25 metres (22 to 27 yards). To obtain a uniform whisper, the examiner should empty the chest of air and whisper with the last breath, *i.e.*, with the residual air. It may be noted here that special attention should be paid to sibilants, the high-pitched soft *g*, *f*, the explosives, and the letter *r*. Hissing sounds (*s*, *sch*.) are usually heard worst in diseases of the conducting apparatus, *f* in labyrinthine disease, and *r* in defects of the tympanic membrane. In testing with speech the ear under examination should be towards the doctor and the other ear firmly closed by the teacher; the child's eyes should also be closed or covered.

In the ordinary medical inspection of school children it is unlikely that the medical officer will proceed further than the whisper test, by which he will be able to segregate the deaf cases and direct their further examination by an otologist. By following this routine, and referring all deaf cases to an official otologist, no matter what the degree of deafness may be, there is a better chance afforded of classification and of timely advice as to the seeking of treatment. By such means a considerable number of cases of early deafness will be detected and prevented from progressing to marked degrees. We could thus materially diminish the number of acquired deaf-mutes and of those deaf children who need special education.

The method of roughly classifying children by the whisper test into bad deafness (below 2 metres), medium deafness (2 to 4 metres), and slight deafness (over 4 metres) is a good one for all practical purposes of routine inspection. It must be remembered that, of the whole cases that will be detected by this method, some 50 per cent. can be cured, and of the remainder a large proportion are capable of considerable improvement, and it

will be a great triumph for medical inspection if by these means a number of children thus have their important sense of hearing preserved. It means an augmentation of the number of normal, self-supporting citizens, and a corresponding decrease of paupers and criminals—actual and potential.

To sum up, all pupils should be examined as regards their hearing in the first year of school life. This examination should consist of a preliminary inspection of all children, with testing of hearing acuity, by the school doctor, and a special examination by an otologist of those found wanting. Both examinations should be repeated for all children kept back in their classes, and in all who have, in the course of the year, suffered from any of the exanthemata or shown signs of ear disease. To make the results of practical value, the examinations should be made in the presence of the teacher, and every case followed up as regards the seeking of treatment.

When a child is brought up for examination as dumb, the medical inspector must decide whether it is mentally defective or deaf. He should, therefore, satisfy himself as to: (1) the condition of the hearing; (2) the child's play and general conduct; (3) its habits as regards cleanliness; (4) its affection and manageableness; (5) the condition of the ears, nose, and throat.

I must, in conclusion, say a few words upon the important question of the education of the deaf child. There has been a rising consciousness upon this subject of late years in England, and, although we are scarcely as yet in the front rank of deaf-teaching countries, we are certainly advancing yearly. There are two highly-important points opened up by this question of deaf education: (1) Where is the deaf child to be taught, and, since this cannot be done to the best advantage without classification, how is the deaf child to be classified?

The turning-point of the whole situation in the education of the deaf lies in the proper handling of language, and, indeed, any system of classification is only a means to an end—the mastery of language. No classification can be complete that does not include those children who are semi-deaf or even slightly deaf, for there is absolutely no sharp line of demarcation between them. The slightly deaf and the better cases of the semi-deaf can be perfectly well taught in special classes in ordinary elementary schools; the former may even do quite well in ordinary hearing classes, provided they are placed in the front desks and the teacher gives them special attention.

Bezold considers that school work is possible when the child can hear loud speech at two metres, as the teacher can generally manage to place himself at that distance from him; those deaf children, whose minimal distance is less than half a metre, can be taught if the teacher can pay them special attention. I am inclined to think, however, that the latter are better taught in special classes.

Having regard to the large classes, numbering from thirty to fifty, that are to be found in many elementary schools, I am of opinion that, in such classes, it is well-nigh impossible for a teacher to give much individual attention to a semi-deaf child, even though he be placed in the front desks. It would therefore be a wise arrangement if, in each school district, there could be one or two special classes for those children who are too deaf to obtain full advantage of the education offered to them in an ordinary class, and that these special classes should be placed in charge of an elementary teacher who is qualified also as a teacher of the deaf. Moreover, the semi-deaf child is better for the companionship of normal children, and should not, therefore, be placed in a deaf school. This would be obviated by the establishment of the special classes referred to, as the child would be with his normal schoolfellows in the playground, whilst receiving special instruction during his working hours. The placing of such classes in the charge of a teacher of the deaf would further ensure that any of the slighter defects of speech due to his diminished hearing acuity would be corrected.

I think, gentlemen, that I have now said enough to show how much work there is for you to do in the departments of ear, nose, and throat. I have purposely omitted any narration of the evil effects of confirmed mouth-breathing or enumeration of the serious complications of middle ear suppuration, or descriptions of rare conditions, like congenital occlusion of the nares, because to do so would merely weary you without adequate return. The first two are now such well-established facts that you are already sufficiently well aware of their importance, whilst as regards the third, your work is to detect the common nose and ear conditions rather than to search for curiosities. Those of you who are specially interested in otology and rhinology will find many opportunities for original research. There are plenty of points upon which we need information. I would strongly advise you to keep private notes of your work and to collect as many facts as possible, for it is large collections of facts that are wanted for the elucidation of many questions as yet unsettled.

NOTES ON DENTAL INSPECTION AND TREATMENT OF SCHOOL CHILDREN AT CAMBRIDGE.

By ANDREW J. LAIRD, M.D., D.P.H.,
Medical Officer of Health, Cambridge.

THE first annual report of the Cambridge Dental Institute for School Children has just been issued, and as this is, I believe, the only institution of the kind in the country, a short account of its origin and of the work done may prove of interest.

The Institute owes its origin to Dr. George Cunningham, the honorary director, to the generosity of Mr. Sedley Taylor, who supplied the necessary funds, and to Dr. Dalton, Chairman of the Public Health Committee. The scheme formulated by these gentlemen was laid before the Education Committee with the result that in April, 1907, the council agreed to a proposal for the inspection of the teeth of the children in the elementary schools, and in October, Mr. A. W. Gant was appointed borough dentist. As the local education authority could not at that time legally undertake treatment, the share of the cost borne by the Corporation has been £50 per annum for inspection only, while the rest of the expense has been borne by Mr. Sedley Taylor. This has amounted to about £360 a year, and includes salaries, rents, materials and printing, but not the initial cost of furnishing and fittings. The premises are of the simplest character, and consist of a waiting room (provided with rocking horses, etc.), and a well-lighted surgery.

The examination of the children was originally conducted along with the general medical inspection, but as it is considered better to examine every child in each school, this arrangement has now been discontinued, and the dental inspection is conducted quite independently. It is found that by this method the work proceeds more rapidly, and the disturbance of the school work is trifling as only half a dozen are present at a time. All the children are examined upon the school premises and during school hours. It might be mentioned that attendance for treatment, although not on school premises, counts as school work.

Early in its career it was found that unless the parents could be reached and made to take an interest in the work, the life of the clinic would be seriously threatened. This

object was achieved by holding meetings for mothers, at which the objects of the undertaking were explained, and the great benefits which the children would receive were pointed out. By enlisting also the co-operation of the teachers, by the distribution of pamphlets, and by popular lectures, the clinic soon became widely known and its success assured.

Experience has also shown that when fillings were done first the children would not afterwards attend for extractions. The rule now is therefore to perform the necessary extractions before beginning any conservative work. A practical point of some importance as likely to affect the popularity of the clinic among the children, is that no extractions whatever are ever done at the clinic. The object of this is that it should never become associated in the children's minds with any painful operation, and consequently arrangements have been made for the dentist to attend at Addenbrooke's Hospital one afternoon a week for this work alone.

The forenoons are devoted to work in the clinic, the younger children being brought generally by their parents or teachers, but some after their first visit come alone. The schools are visited in the afternoons for the purpose of inspection. All the work is carried out by Mr. Gant with the help of a nurse assistant who looks after the premises and instruments, and who takes notes of the inspections at the schools.

With regard to the examinations, these are made with the aid of probe and mirror, each tooth being examined, and its condition carefully recorded upon a dental chart issued by the British Dental Association. The number of children examined at school averages twenty per hour, and the number treated at the clinic about six each morning and about four in an afternoon; however, many of the children have to attend two or even three times before the work is completed (one filling takes generally about twenty minutes).

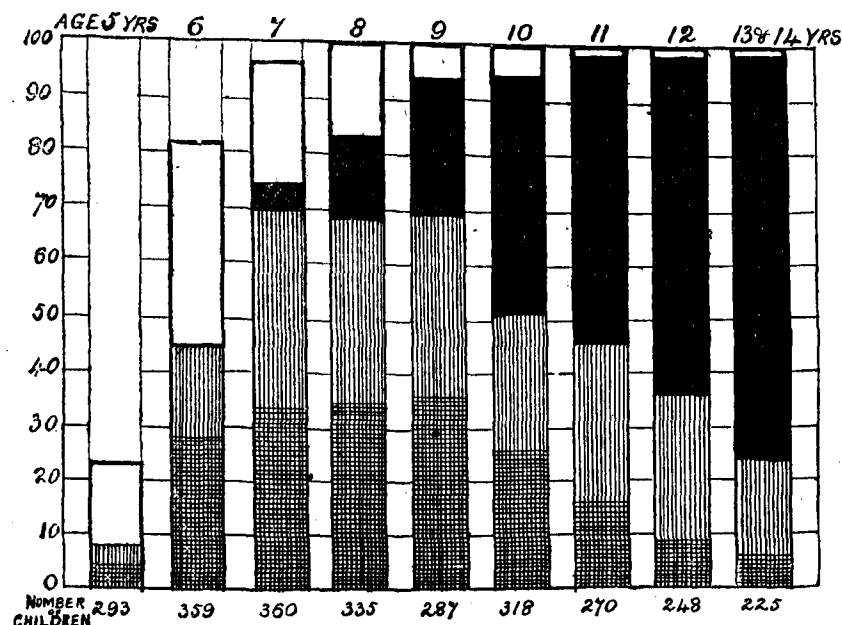
The time spent in examining each child varies considerably, the elder ones taking a much longer time than the very young children on account of their greater number of permanent teeth requiring examination. With very young children a mirror will generally suffice to discover all the caries in the temporary teeth, as it is unfortunately very extensive. In examining the permanent teeth it is necessary to explore each one thoroughly with a fine

probe in order to detect the earliest traces of caries beneath the food caries which covers them.

The actual amount of work accomplished has been limited to some extent owing to the Institute being only in its first year of operation, but it gives a useful indication of the work which a dentist, devoting his whole time to this work, may carry out, and affords a demonstration of the extreme need for attention to the teeth of elementary school children.

all ages beyond 7 years. The actual percentages are shown in the diagram. Excluding the temporary teeth, the number of children with sound permanent teeth was 360, or 15 per cent. The percentages at each year is also shown in the diagram.

The alarming rapidity with which caries is spread if no treatment is undertaken is shown in the last column of the diagram, and also in another part of the annual report which shows that 50 per cent. of the children have nine or more permanent teeth carious at 13-14 years



The height of the column indicates the Percentage of Children having Permanent Molars; the shaded parts of these columns show those with sound and carious teeth.

SOUND SAVABLE SAVED UNSAVABLE

As the report is now in print and can be obtained by any one interested,* it will suffice here, if without going into minute detail, I give only a few of the figures with which it deals.

The total number of school children in the elementary schools is just over 7,000, and of them 2,946 were examined during the year. Only 70 children or 2.4 per cent. had teeth (including both dentitions) which showed no decay. The proportion of children at each year from 3 to 14 with all their teeth sound varied from 11 per cent. at 3 and 4 years, to either none at all or less than 1 per cent. at

* To be obtained from the Town Clerk, Guildhall, Cambridge, price 6d. each.

of age. It is obvious, therefore, that to obtain the best results from the work of a school dentist we must get the children early. In Cambridge the present plan is to treat all those to whom the greatest benefit would result, and this has been found to be children between 5½ and 9 years of age (the six-year molars). At present no attempt is made to deal with temporary teeth; all that can be done is to extract septic teeth and relieve the more urgent symptoms by dressings of silver nitrate. It may be noted that by "unsavable" is meant teeth which cannot be made artificially sound except by more costly and elaborate work than can be undertaken in a school clinic.

THE DISINFECTION OF BOOKS.

IN Volume 62, Part 1 of the *Zeitschrift für Hygiene und Infektionskrankheiten*, Professor A. Gärtner, of Jena, gives an account of an apparatus which he invented for the wholesale disinfection of books.

Although difficult to prove that actual cases of disease have been transmitted by means of books, still the discovery in the leaves of much used books of tubercle bacilli and numerous cocci, coupled with the well-authenticated cases of the transmission of scarlet fever long distances by letter, prove that this method is very probable under certain circumstances, and that, therefore, disinfection of library books is desirable. Apart, however, from these considerations, disinfection would to some extent lessen the distaste which many cleanly and sensitive people have to handle the dirty books of a lending library.

Hitherto, efficient disinfection of books in any quantity has proved extremely difficult, because pure dry or moist heat at sufficiently high temperature to kill organisms will ruin the books and any available gases either injure them or fail to penetrate. Formalin, the best of the ordinary available gases, in addition to the want of penetrating power, leaves behind a very disagreeable smell, and one which many people cannot tolerate. After making numerous experiments with these various methods, the attention of the author was soon directed to the vapours of alcohol and water mixed. After trying a few preliminary experiments to prove the general efficacy and practicability of the mixture, a special apparatus was constructed which consisted of a water jacketed box in which the books could be placed and heated to the required temperature, about 56 c.

After this a vacuum was produced by means of a pump, and when this reached 700 mm. an equal mixture of water and alcohol vapours were let in and effected complete disinfection in about half an hour.

Later it was found that it was very difficult to get the books when put in a large quantity (viz., about 1,000 at a time) heated up equally everywhere, and it was found desirable to construct a similar receptacle where books could be heated to 60 c. before being placed in the disinfector proper.

In this way the author found that the whole process only took two-and-a-half hours, and while the disinfection of the first lot was proceeding, a second 1000 books could be heated, so that in ten hours four charges was dealt with, a total of 4,000 books. By having larger machines 6,000 books could be dealt with in the same time.

As regards general results the disinfection is complete, and the books are in no way damaged. The apparatus was made at the instigation of a large book firm, and will be found very useful where many books require disinfection, such as public libraries, ordinary lending libraries, second hand book dealers, etc.

The prevalence of oral sepsis is indicated by the fact that 30 per cent. of the children had "very dirty teeth and inflamed gums caused by the presence of one or more dead teeth which were discharging pus," while an additional 5½ per cent. had mouths "in such a septic condition as to threaten seriously their general health and well being."

As a result of experience in Cambridge it is considered that one dentist giving his whole time to the work can be responsible for 2,000 children. Although at present no attempt is made to deal with temporary teeth by stopping, this does not mean that other children have not benefitted by the work of the Institute. A very great deal has been done in directing public attention to the need that exists for attending to the condition of the teeth, while at the same time school teachers have been able to bring their influence to bear on both parents and scholars.

It is hoped that with further development of this work, re-examinations of the teeth can be made, but so far this has only been possible in a small number of cases.

There are two other points of some importance in connection with school dental work; one is that if this work is to be of real benefit to the class for whom the clinic exists, the examination should be carried out by a dentist. If undertaken as part of the medical inspection, it is likely that many cases of incipient caries will be overlooked. In addition also it is necessary that a dental chart should be prepared for each child, showing not only the position and extent of caries in the teeth, but the actual amount of masticating surface lost. The school medical officer should not be expected to do more than report on the cleanliness of the mouth and any obvious defects. The second point is the need for enlisting the teachers in this work. Only a very few children are found to use a tooth brush, and in practically every mouth the teeth were coated with a film of food stuff. Lectures on dental hygiene for teachers should be organised, and if this is done and at the same time parents are brought to realise the necessity for cleanliness of the mouth, a great improvement will soon be manifest.

In conclusion, I wish to acknowledge my indebtedness to Dr. George Cunningham and to Mr. A. W. Gant for permission to utilise the figures contained in their report, and for the use of the diagram block.

THE AID OF BACTERIOLOGY IN SANITARY ADMINISTRATION.*

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MY only excuse for bringing before you the points raised in this short paper is that I hope to promote a discussion on a subject which is of considerable importance in public health work, but which nevertheless does not always receive the attention it has a right to claim. An acquaintance with the sanitary administration of several towns has shown me that medical officers of health appeal to bacteriology in very different degrees, and it is with the object of suggesting a greater uniformity in this respect, and especially of urging that bacteriology should have a more important place allotted to it in the routine work of each health department that I venture to submit to you the following remarks.

It is only within comparatively recent times that bacteriology has come to the forefront as an ally of hygiene, and there are still some who refuse to recognise its claim, or who are at least sufficiently conservative to hesitate in invoking its aid to any extent in their public health work. Sometimes, even at meetings of this Society, we still hear the sceptic raise his voice, and even if doubts are not expressed as to the existence of such a well-known organism as the diphtheria bacillus, it is at times questioned whether the bacillus is the cause of the disease we know as diphtheria. I am not, however, going to raise a discussion on such fundamental points as these, which I think almost everyone, who has any knowledge of the subject, admits are now settled. The chief question to be answered is to what extent we can hope at the present time to employ the science with practical benefit in our work, and how far we should induce our authorities to expend money on the investigations carried out at the bacteriological laboratory. At the same time that we are computing its definite practical value to us in our daily work, we must not forget the advantages that accrue to us as medical officers of health from our being in a position to put more of our work, and especially that in connection with infectious disease, on a

scientific basis, and to argue authoritatively with those laymen who think that they are quite as capable of dealing with public health questions as the medical officer they have appointed as their guide. Further, the accumulated results of investigations carried out on scientific lines by all sanitary authorities throughout the country into outbreaks of infectious disease and into the bacterial condition of such known disease-carriers as milk and water, although perhaps in some instances, not serving any obvious purpose at the time, must tend eventually to the advancement of knowledge and to improved methods of sanitary administration.

In the first place we will deal with bacteriology in its relation to infectious disease. Most sanitary authorities, I believe, make some attempt at offering facilities to the medical practitioner for the examination of specimens for the diagnosis of diphtheria, enteric fever and tuberculosis; but even these facilities are often proffered in a somewhat half-hearted manner and are certainly very often received by the medical practitioner with still less enthusiasm. When one considers the difficulty there is in diagnosing the pathological condition in any case of sore throat, it is a matter for surprise, as well as for regret, that advantage is not taken more often of this aid to confirming a diagnosis of diphtheria, or to excluding the disease. It is doubtless the not infrequent experience of many of us to hear of a patient who has been treated for simple tonsillitis, eventually showing symptoms of diphtheritic paralysis; and as probably there has been no thought of isolating these cases from the general public, the chance of their having spread infection is very considerable. In like manner obscure cases of continued fever are often treated for weeks with merely provisional diagnosis and without any thought of appeal to the agglutination reaction.

It is also no uncommon occurrence for laryngeal cases of diphtheria to be overlooked, especially if, as very often happens, there is no evident disease on the fauces. I have repeatedly found that medical practitioners hesitate to pronounce such cases to be of a diphtheritic nature on account of the absence of visible membrane, and for the same reason they consider it to be useless to take a swabbing from the throat for examination. The bacilli are, however, nearly always to be

detected in the faucial secretions of such cases, and it is very important that a bacteriological examination should not be omitted because the fauces present a healthy appearance.

As regards notified cases of diphtheria, it would certainly be a great advantage, from a public health point of view, if a confirmatory bacteriological examination were made in all instances; but on the other hand, neither notification nor treatment should be delayed for the result of the investigation, as only a series of negative results would tend to exclude a diagnosis of diphtheria where the clinical symptoms pointed to that disease. Without this confirmatory examination, the value of our diphtheria statistics is much discounted, and our knowledge of the true origin of this disease, which pays no heed to the advancement of general sanitation, progresses but slowly. Desirable as it is to be certain of the nature of notified cases, it is far more important that cases of sore throat which do not present the generally accepted clinical signs of diphtheria should be examined, for there is no doubt that many of these are mild attacks of that disease. Of course a large proportion of these patients will not come under the notice of a medical practitioner or of the health department; but, at any rate, those children who are absent from school on account of sore throat can be reported to the medical officer of health, and any suspicious throats swabbed before the children are allowed to return.

Another very important point as regards diphtheria is the determination in any instance of the end of infectivity, and this cannot be settled without an appeal to the laboratory. At nearly all fever hospitals patients are not discharged until one or more examinations have failed to show the presence of remaining bacilli, but unfortunately the same precaution is seldom taken by the medical practitioner before he sets his patient free. In face of the general increase in the prevalence of the disease in this country, the omission of this very simple safeguard is much to be regretted, especially as these patients are often declared to be free from infection soon after the local lesion has cleared up, and generally by the end of three weeks, while on the other hand a bacteriological examination often shows the bacilli to persist for weeks longer. The medical officer of health can meet this danger in one direction, for he now has considerable

control over school children and can obtain a swabbing from their throats before allowing their return to school.

The dealing with diphtheria contacts is now another very important part of our work, and makes a considerable demand on the laboratory. The contacts who require our chief attention are again school children, and with our present knowledge we should certainly forbid their return to school from a house where there has been a case of diphtheria, unless a bacteriological examination of their throats has given a negative result. I have systematically examined such children at Warrington and have found a considerable number to have the Klebs-Löffler bacilli in their fauces, although there was no naked eye evidence of disease. In several instances contacts who had been excluded from school have developed clinical signs of diphtheria a few days after their throats had been examined and bacilli found to be present.

As regards typhoid fever and its allies—the paratyphoid fevers—we have the undoubted help in diagnosis which is afforded by the agglutination test, and it is now recognised that many cases, which resemble typhoid fever clinically, but which fail to supply a serum that will agglutinate typhoid bacilli, are instances of one of the paratyphoid fevers, and the blood of these patients will be found to clump the corresponding paratyphoid bacilli. I had recently two interesting examples of this paratyphoid disease in the fever hospital at Warrington. A patient who travelled about in a caravan was admitted suffering from a disease which resembled typhoid fever in its clinical aspects, but the blood of the patient in dilution of 1 in 50 failed on several occasions to give the agglutination test with the bacillus typhosus. Owing to two relapses, the patient's illness was protracted, and after a few weeks one of the nurses who attended the case was taken ill. The nurse presented symptoms of typhoid fever, but her blood in a dilution of 1 in 50 also failed to clump typhoid bacilli. Subsequently, I obtained cultures of bacillus paratyphosus alpha and beta, and the latter bacilli were readily clumped by the blood of both patients in dilutions of 1 in 50.

At the present time probably little is done in the way of examining the faeces and urine of convalescent typhoid patients, but the recent information as to the persistence of

* Read at the Meeting of the North-Western Branch of the Society of Medical Officers of Health on December 18th, 1908.

infection in the excreta of certain persons who have suffered from the disease will probably cause such examinations to be undertaken more often, especially as regards persons who are occupied in the handling or preparation of human food. The specific nature of certain sequelæ of typhoid fever, such as inflammatory conditions of bone, etc., must also be remembered, and the possible presence of typhoid bacilli in any resulting discharges investigated.

Unfortunately at present we derive little help from bacteriology as regards scarlet fever, but in connection with tuberculosis and some other less common infectious diseases such as cerebro-spinal fever, plague, cholera, anthrax, and glanders, we can obtain much assistance from the bacteriological laboratory.

Inseparable from the subject of infectious disease is the question of disinfectants. Here, again, we have neglected the application of bacteriology to a surprising extent; so much so that our chemists are leading the obvious way in the matter. I have already protested against this bacteriological work (for the investigation of disinfectants is now almost entirely a matter for the bacteriologist) leaving medical hands; but I am afraid we have only ourselves to blame in this respect, for we have been slow to investigate the subject scientifically and, as Dr. Barlow pointed out in a recent paper, have accepted with far too implicit faith the uncorroborated statements of the manufacturers as to the efficacy of the so-called disinfectant preparations that are being used by the public and ourselves.

To my mind we can now ascertain with some degree of accuracy what disinfectants are the most efficient under each special set of conditions, and we should therefore banish from our use all that are inefficient.

In the first place, we can determine the relative germicidal power of the various disinfectants compared with that of a standard substance according to the method for which we have to thank those well-known chemists, Dr. Rideal and Mr. Ainsley Walker. This method affords fairly definite knowledge of the action of any preparation on the naked germ, and also supplies a test as to whether a disinfectant is being kept up to a standard which may be guaranteed by the manufacturer. Secondly, we can further test experimentally the action of the preparation on special germs under conditions resembling as far as possible those which obtain in the practical use to

which we desire the disinfectant to be put. It is, of course, these latter tests which will enable us to decide as to what disinfectants to use in our practical work; while the former tests by the Rideal-Walker method will chiefly be useful in determining whether or no the disinfectant is kept up to the standard guaranteed.

If an authoritative body of experts, unassociated in any way with the manufacturers, were appointed by Government to investigate the matter and to indicate what disinfectants are most efficient under various circumstances, the need for each authority carrying out these experiments, except for special purposes, would be obviated.

I now come to an important rôle played by bacteriology in public health work, namely, that of guardian over our water and milk supplies.

In connection with the water supply, there can, I think, be no doubt that we should obtain regular and frequent bacteriological examinations, especially with reference to the presence of *B. coli*, for such examinations are a more delicate test of sewage pollution than the chemical analyses which they should supplement rather than replace.

There are, even experts on the subject admit, many difficulties in the interpretation of the result of a bacteriological examination of a water sample, and hard and fast standards as to what in this respect is a satisfactory, and what an unsatisfactory, water are now generally deprecated. Nevertheless, systematic examinations over a certain period will enable a standard to be fixed for any particular supply, and variations from this standard will then be readily apparent and special pollution at once detected. Further, when this standard has been ascertained for any water supply, a check can be kept on the efficiency of any method of purification which may be adopted.

As regards the milk supply of a town, under the present conditions of sanitary control, we are unable to take full advantage of the help we should obtain from bacteriology.

If it were made compulsory for dairy farmers and milk dealers to cool milk down below a certain temperature immediately after its collection, and to keep it at a low temperature during its transit and storage, the enumeration of the number of organisms

per c.c., and especially of *B. coli*, would give some indication of the amount of added dirt of a harmful nature; but we cannot make use of this guide as to the cleanliness that has been observed in the dealing with milk that has not been cooled down, for organisms multiply with great rapidity in such an excellent culture medium. Investigations into the bacterial content of milk samples have, however, shown the very unsatisfactory condition of the greater part of this important food, and have indicated that far greater care is required in its collection and storage.

The chief bacteriological procedure in connection with milk is the examination for tubercle bacilli; but the detection of this bacillus in any sample of milk is often of less value to the health authority than is at first sight expected, and of less help than if we had further powers in connection with dairy farms. In the first place we have to wait at least three or four weeks from the time of taking the sample before the result of the examination is obtained—unless the bacilli happen to be detected by direct microscopic examination of the centrifugalised milk. Secondly, if the milk prove to be tuberculous and, after following the supply back to the dairy farm, we examine (in company with a veterinary surgeon) the herd, and pick out suspicious cows, there is a further delay. We have now to obtain the veterinary surgeon's certificate that the suspected cow or cows have tubercular disease of the udder, and it is seldom in my experience that he will give such a certificate unless another sample of milk from the udder in question has been proved to contain the bacilli, entailing another delay of probably three to four weeks before we can stop the milk supply from the cows in question.

The difficulty of dealing immediately with suspected cows, when the mixed milk from the dairy farm has been found to be tuberculous, greatly minimises at the present time the practical value of bacteriology in this respect. Nevertheless, this work in connection with milk has brought to light the serious extent to which milk is infected with tubercle bacilli, and has played its part in hurrying on the shortly expected legislation which will doubtless deal with the question at its origin, namely, at the dairy farm. Many of the dark and insanitary cowsheds must be thoroughly infected with the bacilli given

off by generations of tuberculous cows, and it is quite conceivable that milk coming from such premises may be infected, not only from any of the diseased cows that are being milked, but also from dust, etc., which happens to be floating about in the cowshed during the milking process. This very probable source of the tubercle bacilli in the dust of the present insanitary cowsheds is often overlooked, and the search for the origin of the bacilli which have been detected in the mixed supply from a dairy farm is too often limited to the cows producing the milk.

In addition to its aid in the foregoing investigations which comprise the greater part of municipal bacteriology, the laboratory will assist us in diagnosing certain diseases of cattle, such as anthrax and tuberculosis, and will help our enquiries into diseased conditions of food and into outbreaks of food poisoning.

I have thus attempted to outline very briefly the chief practical applications of bacteriology at the present time in public health work. These uses of the science are, of course, well known to all of us, but—and this is my chief point—we do not in my opinion sufficiently encourage this branch of our work which, as a matter of fact, is the scientific basis on which a large part of our sanitary administration rests. In order to adequately make use of bacteriology, each health department should have its own laboratory which should be looked upon as an essential part of the department; and in these laboratories, even in the smaller towns, the necessary investigations should be carried out, except perhaps such as require the inoculation of animals. Unless this obtains, the expense incurred by sending specimens to be examined at some independent laboratory will prevent the extended application of this branch of our work.

In the smaller towns, where there may not be sufficient work for a whole-time bacteriologist, the laboratory can be located at the fever hospital and, if the medical officer of health has not the time to do the work himself, the resident at the hospital or the assistant medical officer of health should also act as bacteriologist. The advantage which the medical officer of health derives from having a well-equipped laboratory close at hand, and from his being able to investigate any doubtful case of infectious disease both clinically and in the laboratory, is evident; and only those

who thus personally see both sides of the picture can fully appreciate the value of the agglutination reaction or the futility of attempting to diagnose diphtheria without a bacteriological investigation.

For the past four or five years, during which I have been connected with infectious disease hospitals, I have made a practice of investigating cases of diphtheria and enteric fever both at the bedside and in the laboratory, and it has been a rare occurrence for the bacteriological results to be negatived by the subsequent course of the illness. Due care must of necessity be exercised in taking the specimens for examination, and carelessness in this procedure will in great part account for many failures in detecting the bacilli in swabbings from throats of diphtheritic patients. Instances, too, where the blood of patients, suffering from apparently typical attacks of typhoid fever, has failed to give the agglutination test with typhoid bacilli, may now be explained on the ground that these were infections by the bacillus Paratyphosus and not by the bacillus Typhosus, and consequently the blood would have given a positive reaction if tested against the former bacillus.

One cannot make a routine examination of diphtheria convalescents without being struck by the number of cases which continue to harbour the bacilli in their throats for a considerable time longer than three weeks; and when one considers that home treated cases are rarely isolated longer than three weeks, it is evident that we cannot hope to deal satisfactorily with diphtheria so long as the medical practitioner fails to make use of bacteriology to determine the end of infectivity. In like manner, if we are to grapple at all effectively with this disease, we must see that cases of sore throat are more fully investigated and that a routine bacteriological examination of contacts is made.

In this paper I have chiefly referred to the public health side of the subject, and especially to the increased protection which would be afforded to the general public by a more extended use of bacteriology. While this aspect of the question is perhaps the one which concerns the medical officer of health the more closely, there is also the patient's interest to be considered. Therapeutic sera, which at the present day are among our most potent remedies, require for their successful application that an early and definite diagnosis should

be made, and it is fully proved by statistics that the administration of antitoxins is the more successful the earlier it is undertaken, and that delay in the use of the remedy carries with it proportional loss for the patient of the advantages offered by this line of treatment. Hence, for this reason also, it is very necessary that means for an immediate bacteriological examination of any suspected case should be within easy reach. Then only will the practitioner make full use of the laboratory, and then only shall we be able to complain if he still neglects to avail himself of it. At the present time not only does the general public suffer through being often exposed to the infection of undiagnosed cases of infectious disease, but the patient also suffers from the delay in receiving suitable treatment.

We have also a field for work in studying the special germs of our own districts, for doubtless there are variations of the same bacillus in different localities, and an antitoxin which is successful against the toxins furnished by the strain of bacillus found in one district may not equally succeed against those of the somewhat modified bacillus flourishing in another part of the country. In my own experience, for example, diphtheria does not respond to the action of antitoxin in the north of England to the same extent as in the south; and the same difference in the disease is shown by statistics, for while the case mortality rate in the northern towns ranges at about 20 per cent. or more, that for the southern towns averages little over 12 per cent.

In conclusion, I would suggest that, with a little more scientific investigation on the part of the various health departments, many important everyday questions, such as whether drain or sewer air is ever found to convey the germs of diphtheria and typhoid fever, may be more definitely settled, and that we may then be able to speak from the results of our practical experiments instead of merely expressing pious opinions on the subject.

MIDWIVES' ACT COMMITTEE.—The Departmental Committee appointed by the Lord President of the Council to consider the working of the Midwives' Act, held its sixth meeting on March 10th at the Privy Council Office, Mr. Almeric FitzRoy presiding. The following witnesses attended and gave evidence: Sir George Fordham, the Treasurer of the Central Midwives Board, and representative of the County Councils Association; Dr. A. Robinson, Medical Officer of Health for the County Borough of Rotherham; and Mrs. Heywood Johnstone, President of the Rural Midwives Association.

THE MEDICAL RECOMMENDATIONS OF THE POOR LAW COMMISSION.

Below will be found the recommendations relating to medical assistance of the Majority and Minority Reports, arranged in parallel columns for reference.

MAJORITY REPORT.

1. That medical assistance should be re-organised on a provident basis.
2. That in certain cases power of compulsory removal to and detention in an institution should be given to the authorities, under proper safeguards.
3. That there should be systematic co-operation between the Public Assistance Authorities, the Sanitary Authorities, the Education Authorities, and the voluntary medical institutions, based on a clear definition of their respective functions.
4. That no disfranchisement should be attached to any form of medical assistance.
5. That the arrangements for indoor and outdoor medical assistance should be periodically inspected by medical inspectors on behalf of the Local Government Board.

Functions of the Public Assistance Authority as to Medical Assistance.

6. That in taking over the existing powers and duties of Boards of Guardians in regard to medical relief, the Public Assistance Authority shall undertake the following functions:—
 - (i.) To co-ordinate and, where necessary, supplement the medical institutions of the county or county borough, and to suggest methods of co-operation with the sanitary authorities and the authorities in charge of voluntary hospitals.
 - (ii.) To organise an outdoor and provident medical service easily accessible in all parts of the county or county borough, this service to include the provision of competent midwives.
 - (iii.) To develop an adequate nursing service, preferably in connection with voluntary nursing associations.
 - (iv.) To subscribe, when necessary, towards these purposes.
 - (v.) To arrange for adequate supervision of and report on the efficiency and adequacy of the medical institutions and medical service.

Establishment of Medical Assistance Committees.

7. That, to assist the Public Assistance Authority in carrying out the above functions, they shall appoint a committee from among their members, to which shall be added representatives of the Health Committees of the County Council or the County Borough Council, and of the local branch or branches of the British Medical Association. This committee shall be called the Medical Assistance Committee, and shall have

MINORITY REPORT.

1. That the continued existence of two separate rate-supported medical services in all parts of the United Kingdom, costing, in the aggregate, six or seven millions sterling annually—overlapping, unco-ordinated with each other, and sometimes actually conflicting with each other's work—cannot be justified.

2. That the very principle of the Poor-law Medical Service—its restriction to persons who prove themselves to be destitute—involves delay and reluctance in the application of the sick person for treatment; hesitation and delay in beginning the treatment; and, in strictly administered districts, actual refusal of all treatment to persons who are in need of it, but who can manage to pay for some cheap substitute. These defects, which we regard as inherent in any medical service administered by a Destitution Authority, stand in the way of the discovery and early treatment of incipient disease, and accordingly deprive the medical treatment of most of its value.

3. That it has been demonstrated to us beyond all dispute that the deterrent aspect which the medical branch of the Poor Law acquires through its association with the Destitution Authority, causes, merely by preventing prompt and early application by the sick poor for medical treatment, an untold amount of aggravation of disease, personal suffering, and reduction in the wealth-producing power of the manual working class.

4. That the operations of the Poor-law Medical Service, being controlled by Destitution Authorities and administered by destitution officers, inevitably take on the character of unconditional "medical relief"—that is, relief of the real or fancied painful symptoms—as distinguished from remedial changes of regimen and removal of injurious conditions, upon which any really curative treatment, or any effective prevention of the spread or recurrence of disease, is nowadays recognised to depend.

5. That while domiciliary treatment of the sick poor is appropriate in many cases, it ought to be withheld (1) where proper treatment in the house is impracticable; (2) where the patient persistently malingers or refuses to conform to the prescribed regimen; or (3) when the patient is a source of danger to others. It has become imperative in the public interest that there should be, for extreme cases, powers of compulsory removal to a proper place of treatment. Such powers cannot, and in our opinion, should not, be granted to a Destitution Authority.

6. That where Destitution Authorities cease to abide by the limitation of their work to persons

power to co-opt representatives of local hospitals, nursing associations, dispensaries, and registered friendly societies.

8. That, where necessary, a local committee shall be appointed by each Public Assistance Committee for the purposes of the local administration of medical assistance.

9. That all or any of the functions defined in No. 6 may be referred by the Public Assistance Authority to the County or County Borough Medical Assistance Committee.

10. That the following shall be the lines of procedure for carrying out the functions mentioned in No. 6:—

- (i.) To consider, in conjunction with each local Medical Assistance Committee, the needs of the county or county borough and the needs of each relief district in the way of hospital (including infirmary) accommodation.
- (ii.) To re-organise existing Poor-law medical institutions throughout the county or county borough, with a view to making them more effective for different classes of patients. (This would be done in conjunction with the committees in charge of workhouses, schools, etc.)
- (iii.) To organise schemes of co-operation between public assistance institutions and voluntary hospitals.
- (iv.) To develop a system of paying and free cottage hospitals in conjunction with voluntary and endowed charities, these to include provision for confinement cases.
- (v.) To arrange schemes of co-operation between hospital and provident dispensaries or outdoor medical service.

Outdoor Medical Service.

- (i.) To require the local Medical Assistance Committee, in conjunction with the local doctor, to map out their district into convenient medical districts or "dispensary areas."
- (ii.) To approach any free or provident medical institution, including private medical clubs, already existing in the district, and invite them to fall into line with the scheme (refusal not to check procedure).
- (iii.) The local authority may subscribe to the provident dispensaries, subject to the sanction of the Local Government Board, and under the conditions mentioned in Section 10 of the Poor Law Act, 1879.

Relation of the Poor Law to Provident Dispensaries.

11. That where any applicant for medical assistance is not a member of a provident society, he shall apply to and at once be treated by a district medical officer.

12. That the relieving officer, or, as he will be called in future, the assistance officer, shall inquire into and report the case to the Public Assistance Committee, whose action shall be directed towards (a) recovery of cost; (b) strengthening of provident agencies.

really destitute, or pass beyond the dole of "medical relief," their attempt to extend the range or improve the quality of the Poor-law Medical Service brings new perils. We cannot regard with any favour any action which, in order to promote treatment, opens, or tacitly invites, people voluntarily to range themselves among the destitute; or which tempts them, by the prospect of getting costly and specialised forms of treatment, to simulate destitution. Nor do we think that an authority charged with the relief of destitution, whatever its method of appointment, or whatever the area over which it acts; or any authority acting through officers concerned with such relief whatever their official designation, can ever administer a medical service with efficiency and economy.

7. That, with regard to the suggestion that the medical treatment of the sick poor should be left either to provident medical assurance or to voluntary charity, it has been demonstrated to us that these offer no possible alternative to the provision for the sick made by the public authority. With regard to domiciliary treatment, the evidence as to medical clubs, "contract practice," provident dispensaries, and the out-patient departments of hospitals, is such as to make it impossible to recommend, in their favour, any restriction of the services at present afforded by the district medical officers and Poor-law dispensaries. Nor do we feel warranted in giving any support to the proposal made to us that the whole of the outdoor medical service of the Poor Law should be superseded by a publicly-subsidised system of letting the poor choose their own doctors. Any such system would, in our judgment, lead to an extravagant expenditure of public funds on popular remedies and "medical extras," without obtaining in return for this enlarged "medical relief," greater regularity of life or more hygienic habits in the patient. With regard to institutional treatment, we gladly recognise the inestimable services rendered to the sick poor by the hospitals, sanatoria, and convalescent homes supported by endowments or voluntary contributions. We approve of the use now made of these institutions by public authorities, and we think that many more suitable cases than at present might, on proper arrangements as to payment, be transferred from rate-maintained to voluntary institutions. But it is clear that such institutions provide only for a small fraction of the need, and that they leave untouched whole districts for some cases, and whole classes of cases everywhere, which there is no prospect of their being able to undertake.

8. That the medical service of the Public Health Authorities, which now extensively treat disease, and actually maintains out of the rates a steadily increasing number of the sick poor, is based on principles more suited to a State medical service than that of the Poor Law. These principles, which lead in practice as well as in theory, to searching out disease, securing the earliest possible diagnosis, taking hold of the incipient case, removing injurious conditions, applying specialised treatment, enforcing healthy surroundings and personal hygiene, and aiming always at

13. That with a view to enlisting the services of all competent medical practitioners in the locality of a provident dispensary, the British Medical Association be requested to suggest a general scheme of fees and wage limit to be applied by their local branches as local circumstances may suggest.

14. That under such scheme all local medical practitioners consenting to come under it shall be on the list of dispensary doctors, and any applicant who is a member of the dispensary shall be entitled to select such practitioners as he may prefer.

15. That arrangements should be made, where necessary, for the reception of patients in voluntary and general hospitals by the payment of their costs or by some other agreement between the Public Assistance Committee and those in management of the hospital.

16. That any practitioner attached to a provident dispensary may, where the patient is a member of such dispensary and in need of institutional treatment, recommend him for admission to the local public assistance infirmary, and in certain cases, where arrangements have been made, to a voluntary or general hospital.

17. That so far as the patient is concerned, admission under such conditions shall be covered by the subscription to the provident dispensary.

18. That as regards certain cases in receipt of public assistance (such as the aged and widows with young children) the Public Assistance Committee may enrol all such cases as members of a provident dispensary by paying the necessary fees.

The Majority report is signed as follows:—

GEORGE HAMILTON.	CHARLES S. LOCH.
DENIS KELLY.	J. PATTEN MACDOUGALL.
H. A. ROBINSON.	THOMAS HANCOCK NUNN.
S. B. PROVIS.	L. R. PHELPS.
F. M. BENTHAM.	W. SMART.
(1) ARTHUR DOWNES.	HELEN BOSANQUET.
THORN GAGE GARDINER.	(2) OCTAVIA HILL.

(1) and (2) sign subject to reservations, some of which affect the question of medical relief.

Miss Octavia Hill considers the scheme of medical relief to be, in her opinion, unworkable, and, moreover, to open the door too widely to free medical relief. Dr. Downes presents a special memorandum in which he expresses similar views.

UNWHOLESOME OYSTERS.—At the Mansion House, on November 30th, Mr. Thomas Moore Wright, a fish salesman at Billingsgate Market, was summoned before the Lord Mayor by the Fishmongers' Company for having in his possession for the purpose of sale 600 oysters which were unwholesome and unfit for food. Mr. Ivory, K.C. (who appeared for the defendant), said as the statute did not allege any knowledge of wilful default on the part of a defendant, and as the offence was complete by the mere possession of these unwholesome

preventing either recurrence or spread of disease in contrast to the mere "relief" of the individual—furnish, in fact, the only proper basis for the expenditure of public money on a medical service.

9. That such compulsory powers of removal in extreme cases, as have been asked for, are analogous to those already exercised, with full public approval, by the Public Health Authorities; and that the proposed extension of such powers can properly be granted only to an authority proceeding on Public Health lines.

10. That we therefore agree with the responsible heads of all the four Medical Departments concerned: The Medical Officer of the Local Government Board for England and Wales, the Medical Member of the Local Government Board for Scotland, the Medical Commissioner of the Local Government Board for Ireland, and the Medical Officer of the Board of Education in ascribing the defects of the existing arrangements fundamentally to the lack of a unified medical service based on Public Health principles.

11. That in such a unified medical service, organised in districts of suitable extent, the existing medical officers of health, hospital superintendents, school doctors, district medical officers, workhouse and dispensary doctors, and medical superintendents of Poor-law infirmaries, the clinicians as well as the sanitarians would all find appropriate spheres; that one among them being placed in administrative control who has developed most administrative capacity.

12. That we do not agree with the suggestion that the establishment of a unified medical service on Public Health lines necessarily involves the gratuitous provision of medical treatment to all applicants. It is clear that in the public interest, neither the promptitude nor the efficiency of the medical treatment must be in any way limited by considerations of whether the patient can or should repay its cost. But we see no reason why Parliament should not embody, in a clear and consistent code, definite rules of chargeability, either relating to the treatment of all diseases or of all but those specifically named, and of recovery of the charge thus made from all patients who are able to pay.

The Minority Report is signed as follows:—

H. RUSSELL WAKEFIELD.	GEORGE LANSBURY.
FRANCIS CHANDLER.	BEATRICE WEBB.

oysters, Mr. Wright, by his advice, would plead "Guilty." As a matter of fact, he had no personal knowledge that the oysters were at Billingsgate, as he was not in London at the time. The Lord Mayor said the case was an illustration of the good and useful work the Fishmongers' Company were doing in the interests of public health. The defendant had rendered himself liable to a fine of £30,000—that was to say, £50 for each of the 600 oysters. The justice of the case would be met by a fine of 15 guineas and 10 guineas costs.

THE POOR LAW COMMISSION REPORT.

POOR LAW MEDICAL OFFICERS' ASSOCIATION.

THE following resolutions were unanimously carried at the council meeting of the Poor Law Medical Officers' Association of England and Wales held on March 11th:—

"(1) That this council desires to express its grateful acknowledgment of the unanimous testimony borne by the Royal Commission to the value of the past services of Poor Law medical officers, and their recognition of the disadvantages under which they have laboured, and the inadequacy of their remuneration.

"(2) That, in the opinion of the council, it is impossible for Poor Law medical relief to be organised on a provident basis, as the only proper recipients of such relief are by reason of their poverty unable to contribute anything; that those able to contribute are not proper objects for charitable assistance.

"(3) That the council views with the strongest disapprobation the proposal to draft the State poor on to provident medical institutions; that in their opinion it would result in converting the same into Poor Law institutions, mainly supported by the rates; that it would be disastrous to these institutions by driving away many, if not all, of that class for whom they were specially created. Further, that it would largely increase the number of the State poor by adding to them many of the poorer members of provident medical institutions, and by so doing would inevitably cause great injury to the whole medical profession, especially the practitioners in poor districts.

"(4) That the council strongly condemns the proposal to make every medical practitioner a Poor Law medical officer, and it does so for the following reasons:—(a) It would be many times more expensive than the present system; (b) that the value of the work done could never be properly tested, as no system of Local Government Board inspection could deal with so widely extended an arrangement for Poor Law medical relief; (c) that it would largely tend to provide free medical relief to all poor persons, and to increase, rather than diminish, the pauperisation of the nation; (d) that the interests of the sick State poor would be far better attended to by a special service, the members of which were adequately paid, and whose work was capable of proper inspection.

"(5) That the council strongly disapproves of the proposal to allow a poor person to claim State medical relief without the intervention of a relieving officer or assistance officer; that it would be opening the door widely to gratuitous medical relief to all members of the poorer classes; that it is no part of the duties of a Poor Law medical officer to decide as to the right of a poor person to State relief; and as in any widely extended system it would be necessary to pay for the items of work done by the medical officer, it would be a direct incentive to the latter to admit too readily the claims of poverty; that for the protection of the ratepayer it is absolutely necessary that there should be a skilled lay officer to decide who are proper applicants for medical relief; that in

thickly-populated areas there is no hardship in requiring applicants to get an order from an assistance officer, and that instances of the deserving State poor being deterred from applying to the Poor Law medical officer through having first to obtain an order are in urban districts conspicuous by their rarity."

A SUCCESSFUL PROSECUTION UNDER THE MODEL MILK CLAUSES.—At the Sunderland Borough Police Court on March 16th, a dairyman, of Grangetown, was charged with having contravened an order made under the Borough of Sunderland Corporation Act, 1907, by sending milk into Sunderland from cows suffering from tuberculosis. It appears that the defendant carried on his business as a dairyman at Grangetown, outside the confines of the borough, but by supplying milk into the borough from cows suffering from tuberculosis he had brought himself within the provisions of the Corporation Act of 1907. In February it was found that certain of defendant's cows were suffering from tuberculosis, and proceedings were taken at the instance of the Health Committee of the Corporation, which resulted in an order being made under the Act prohibiting defendant from supplying milk from seven cows upon his premises suffering from tuberculosis within the borough of Sunderland. The order was duly served upon the defendant, and he promised to obey it. The defendant on a certain day in February, after the receipt of the order, admitted that he had been sending milk into Sunderland from these seven diseased cows, he having mixed it with other milk obtained from healthy cows. He was charged on information with having committed the offence on February 8th, and on each day following up to and including the 17th, and he was liable to a penalty of 40s. a day while the order was being contravened.

Police Sergeant Banks, of the County Constabulary, stated that on February 18th he saw the defendant on his premises at Grangetown. Defendant told him that he had twenty-two cows, and that seven were suffering from tuberculosis. Four of these cows were in a small byre and the other three were with the remaining eighteen cows in a larger byre. In answer to a question as to what he did with the milk taken from the diseased cows, defendant said he mixed it with the other milk the same as he had always done and sent it into Sunderland. Witness then said to him: "Are you not prohibited from sending milk from these cows into the borough?" To which he replied: "Yes; but that is only the order of the Town Clerk and the Medical Officer. The committee did not send the order. It is only spite."

The magistrates, in imposing a penalty of 20s. and costs, stated that they were agreed the case had been fully proved, but they believed defendant acted under a misapprehension, and had decided, this being the first case under the Act, to inflict a light penalty. They wished it to be understood, however, that any other similar cases that came before them in the future would not be dealt with so leniently.

REVIEWS.

THE DIAGNOSIS OF SMALLPOX. By T. F. Ricketts, M.D., D.P.H., Medical Superintendent of the Smallpox Hospitals of the Metropolitan Asylums Board. Illustrated from photographs by J. B. Byles, M.B., D.P.H., Senior Assistant Medical Officer at the Smallpox Hospitals of the Metropolitan Asylums Board. Cassell & Co. Price 21s.

The diagnosis of smallpox has now become a very formidable affair. On the one hand the importance of making a correct diagnosis has greatly increased with the increasing public demand for immediate removal and segregation of smallpox patients, while on the other hand the difficulties of diagnosis have been intensified by vaccination, which not only deprives the practitioner of clinical material for study, but may also modify the clinical features of the disease almost beyond recognition. As Dr. Ricketts points out, Jenner has made smallpox a different disease—"easier to suffer, but harder to distinguish." The result of all this is that the diagnosis of smallpox has been the occasion of many mistakes and of serious damage to not a few professional reputations. The ability to form a correct opinion in a doubtful case of smallpox is a valuable asset to any medical practitioner, especially to the Medical Officer of Health, and anything that helps to develop that ability deserves a warm welcome from the whole profession.

This is what the present volume does. With 147 pages of trenchant English and 121 photographs of surprising excellence, the authors have put forth a description of smallpox which goes much farther than we should have thought it possible that a book could go to supply the lack of actual clinical experience. The object of the book throughout is to afford assistance, and we have no doubt that to many a perplexed practitioner it will prove a "very present help in time of trouble."

Dr. Ricketts conceives of smallpox as a dual disease. At first there is a toxæmia, the duration of which is about a week, and during its course the patient may develop a toxæmic rash. This varicellous toxæmia is analogous to that of scarlet fever; but the peculiarity of smallpox is that half-way through the primary toxæmia a focal rash is developed, which may be so severe as to be capable itself of causing serious or even fatal illness. What is a "focal" rash? It is a rash due to the local action of certain organisms, and is contrasted with the toxæmic rash caused by the circulation in the blood of a chemical product. In smallpox, Dr. Ricketts points out, this "focal" rash, like most focal rashes, consists of circumscribed lesions, and the constitutional effects which they produce are in direct proportion to their number and severity. A boil is a focal lesion, inconsiderable in effect; but if the body were covered with boils the illness to which they would give rise would be serious and the fever considerable. It is so with the focal rash and secondary fever of smallpox." The diagnosis of smallpox

turns largely upon the nature of the focal rash, and the evidence presented by the rash depends partly upon the anatomical character of the individual lesions, and partly upon their distribution on the body. It is the chief characteristic of Dr. Ricketts's teaching, that he holds that the distribution of the rash affords more valuable evidence than the anatomical character of the lesions.

In describing the distribution of the rash, Dr. Ricketts does not merely present a catalogue of the parts of the body chiefly affected. He shows the distribution as the expression of an underlying principle, namely, that distribution is determined by cutaneous stimulation. The causes of the stimulation are numerous, "but the most potent factors are exposure to air and friction with clothing, and to their efficacy every case of smallpox is a testimonial." The stimulation acts by favouring the precipitation of the infective particles out of the blood stream into the skin, the mechanism of the precipitation being probably something in the nature of an embolism. In the light of this hypothesis, Dr. Ricketts proceeds to describe the distribution of the rash in detail, and the result of his masterly analysis is to show that in every case the facts can be explained by the simple principle of cutaneous stimulation. He then discusses, with conspicuous ability, the anatomical character of the focal rash, the toxæmic fever and rashes, hæmorrhagic smallpox, and the important question of differential diagnosis. The book is the product of the ripe experience of a brilliant clinician who has had exceptional opportunities for observation, and it is written in a style of remarkable literary power and distinction, and with a command of vivid descriptive writing extremely unusual in works of this kind. The following description of a patient with severe confluent smallpox, is an example of the author's skill in presenting a clinical picture:—

"The natural features are obliterated, partly by the rank growth of pustules, partly by the swelling of the skin below them. The face is bigger and broader, and the patient looks unnaturally aged. His orbits swell up and the eyelids, and he peers out through the slits between them. The nose is thick and squat, like a bottle-nose; the lips are like a negro's, but immobile, dough-like. The cheeks are puffed out, and the ears are thickened. The play of features is paralysed by the mass which clogs their movements. The patient mumbles when he speaks, and his voice is hoarse or whispering from the swelling of his larynx. The hands are swollen, and he moves his fingers like pegs."

The book is illustrated by 121 photographs which are far in advance of anything of the kind we have yet seen. They include twenty stereoscopic plates, and eleven colour photographs taken from life and produced from triple negatives obtained by the Sanger-Shepherd process of colour photography. The photographs constitute Dr. Byles' contribution to the book, and he is greatly to be congratulated on the extraordinary results he has obtained. Both Dr. Ricketts and Dr. Byles have, indeed, good cause to be satisfied with the results of their labours. To have produced a book of real practical service is in itself an achievement

for which they deserve the thanks of their profession. But they have done much more than this. It is not too much to say that they have made a splendid addition to the few classics of which medical literature can boast.

FOREIGN SOLUTIONS OF POOR LAW PROBLEMS. By Edith Sellars. Horace Marshall and Son. Price 2s. 6d. net.

This little book is of special interest just now when our own Poor Law system is so much under discussion. Miss Sellars has been studying foreign Poor Law systems for twelve years, and the articles contained in this volume show that some, at least, of the problems with which we are still grappling have already been solved, or partly solved elsewhere. The methods of dealing with the children of the State in Hungary and Berlin are fully and most interestingly described. There are chapters on the old-age homes in Prussia, Denmark, and Austria, on the general workhouse in Austria, and the Beggar's Colonies in Belgium.

Speaking generally, there is on the Continent a few greater attempts than in England to classify the poor and mete out to them the treatment they deserve. In Vienna, for instance, the children and the old people for whom the State provides are not regarded as belonging to the pauper class. In the *Versorgungshäuser* the deserving poor over sixty find life made as easy and pleasant as possible for them. For the less deserving old people there is a stricter establishment, while for the loafers and vagrants there is the penal workhouse where "they are not only punished and forced to work but are taught how to work." As in Denmark, too, a helping hand is given to those temporarily out of work in such a way as to prevent them from drifting into pauperism. Throughout Germany, the invalid poor are better and more promptly treated than here. "In Berlin, no working-man stricken with consumption is left lingering on untended until he has lost nine-tenths of his chance of recovery and spread infection far and wide."

It appears that not one of the ten systems studied by Miss Sellars is worked at so great a cost as our own. The State child in London costs some three times as much as a State child in Berlin, although it is neither so well cared for nor so well taught. The inmate of our most comfortable of London workhouses cost 6½d. a day more than one who lives almost luxuriously in the most expensive of the Vienna old age houses.

REPORT ON DENTAL INSPECTION AND TREATMENT OF SCHOOL CHILDREN. Printed for the Borough of Cambridge by the Express Printing Works, King Street, Cambridge. Price 6d.

This is the first annual report of the Cambridge school dental clinic, the work of which is described by Dr. Laird, the medical officer of health, in our present issue. It is a document of great interest and value and it shows what can be done towards the solution of a problem that is too often regarded as almost too appalling to be dealt with. We wish

this report a wide circulation, and should like it to be read by every school doctor and every member of an education authority in the country.

CORRESPONDENCE.

CHILDREN'S COUNTRY HOLIDAY FUND.

To the Editor of PUBLIC HEALTH.

SIR,—In the epitome of the discussion on Canon Barnett's remarks, I hope I have been misquoted. What I intended to convey was that the system of boarding-out the holiday children carries with it an inevitable risk which the ratepayers of the favoured districts consider to be unjustifiable. I wished to suggest to Canon Barnett that no precautions which could reasonably be taken by the administrators of the fund could obviate the risk, since enquiries could only relate to cases of the infectious diseases actually notified, and could not provide against unrecognised attacks, whilst even an ordinary medical examination would not guarantee that a child had not recently been suffering from a slight attack of scarlet fever or diphtheria; and that only a bacteriological examination would reveal the carrier case of diphtheria.

It really is not a question of whether cases of scarlet fever and diphtheria arise among these children when they come down for their holiday, or even of whether they cause recognised attacks occasionally among the families on which they are boarded. The trouble is that they are apt to introduce a mild form of infection, that owing to the schools being closed some of the cases are overlooked, and that by the end of September a considerable epidemic is established, and under these conditions a penny rate is soon expended.

In Reigate the children come in three or four batches of twenty and thirty each, and when their time is up they are succeeded by a similar number of batches, the procedure lasting throughout August. We are usually practically free from scarlet fever and diphtheria in June and July, a few cases happen in August, and an outbreak in September, always originating in the particular localities where these children are boarded.

Apart from the expenditure on isolation, a considerable amount of money in the form of wages is lost through the epidemic by innocent persons.

Last year diphtheria broke out in one batch of holiday children, and, when this became known, two families cancelled their rooms at an old-established country inn in the Borough where they were accustomed to stop a month, and the proprietor reckoned that he had lost thereby at least £50.

It is not surprising, therefore, that the advent of these holiday children under existing conditions is not welcomed by the districts to which they are sent.

I am, etc.,

A. E. PORTER.

WEETWOOD,
THE WAY, REIGATE.
March 17th, 1909.

MIDWIVES ACT COMMITTEE.—The seventh meeting of the Departmental Committee appointed by the Lord President of the Council to consider the working of the Midwives Act was held at the Privy Council Office on March 17th. The following witnesses attended and gave evidence:—Dr. E. W. Hope, Medical Officer of Health, Liverpool; Dr. G. H. Fosbroke, Medical Officer of Health, Worcestershire; Dr. J. R. Kaye, Medical Officer of Health, West Riding, Yorkshire.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

A GENERAL MEETING of the Society of Medical Officers of Health was held at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, March 12th, 1909, at 7.30 p.m. Present:—The President, Dr. Edward Sergeant (in the Chair), Drs. F. E. Cane, F. W. Bywater, J. R. Kaye, R. A. Lyster, J. S. Tew, E. H. Snell, J. Tubb Thomas, L. M. Bowen Jones, W. H. Symons, G. F. McCleary, W. A. Evans, H. M. Richards, Randle Harper, and Meredith Young, Herbert Jones.

MINUTES.

The Minutes of the previous Meeting held on February 12th, and published in PUBLIC HEALTH for March, 1909, were taken as read, were approved, and duly signed by the Chairman.

NOMINATIONS.

THE HON. SECRETARY read a list of nominations for election to the Society.

ELECTIONS.

The following Candidates who had been duly nominated were ballotted for, and the President declared them to be duly elected:—

AS FELLOWS.

Neil Campbell, M.B., C.M., D.P.H., 45, Commercial Road, Dereham, Norfolk. James Buchanan, M.B., M.Ch., 20, Station Road, Watford; Watford U.D. (S.M.O.). Albert Henry Bygott, M.D., D.P.H., St. John's House, Swaythling, Southampton; Hampshire C.C. (Assist.). Wm. J. MacKinnon, M.D., D.P.H. (Captain R.A.M.C.), Glengorm, Biggar, N.B. Edward P. Minett, M.D., D.P.H., F.C.S., Guy's Hospital, S.E. C. W. P. Moffatt, B.A., M.B., D.P.H., Sanitary Office, Bolton; Bolton C.B. (Assist.). Harry Osborne, M.D., D.P.H., 23, Princes Avenue, Old Trafford, Salford; Salford C.B. (Assist.). E. L. Parry-Edwards, B.A., M.D., D.P.H., County Buildings, Carnarvon; Carnarvonshire C.S.D. James J. Paterson, M.B., B.Sc., D.P.H., 119, Speakman Road, St. Helen's; St. Helen's C.B. (Assist.). Andrew Philip, M.D., D.P.H., 6, Riverside Road, Norwich. A. E. R. Weaver, M.D., D.P.H., Appleton, Albany Road, Earlsdon, Coventry; Coventry C.B. (Assist.).

Dr. J. R. KAYE introduced a discussion upon "Amendments to the Midwives Act."*

HOME COUNTIES BRANCH.—A special meeting was held on Friday, March 5th, to take into consideration amendments to the Midwives Act, 1902, suggested by a committee of the parent Society. These amendments were carefully considered seriatim, and the decision arrived at recorded, and subsequently sent to the Council by the Hon. Secretary (Dr. Sidney C. Lawrence). Dr. Crookshank, ex-President of the Branch, took the chair on this occasion at the special request of the President, Dr. F. E. Fremantle, who is a member of the Departmental Committee established by the Government to consider the subject.

An ordinary meeting of the Branch was held on Thursday, March 18th, to receive a paper from

* To be published in a future number of PUBLIC HEALTH.

Dr. Howarth, the County M.O.H. for Kent, on "Some Increasing Rates of Mortality." It proved an opportune and interesting subject for discussion, in which Drs. Sanders, Tew, W. Butler, the Hon. Secretary, and the President joined.

MIDLAND BRANCH.—A meeting of the Midland Branch was held on Thursday, March 4th, 1909, at 3.30 p.m., at the Council House, Birmingham. Present:—Dr. Reginald Green (President), Drs. G. H. Fosbroke, H. Handford, Henry Malet, W. Clendinnen, T. Ridley Bailey, Henry May, J. W. Miller, M. Gepp, Helena B. Jones, W. Sisam, A. E. R. Weaver, A. Hamilton Wood, E. Peacock, L. W. Pole, J. Robertson, Catherine Fraser, Mabyon Read, F. H. May, Edith Oversby, and E. H. Snell.

A communication was read from the Secretary of the Society enclosing certain suggested amendments to the Midwives Act, and asking for the views of the Branch with a view to the Society giving evidence before the Midwives Act Committee. Certain recommendations of the Council of the Branch were received on these suggested amendments; a discussion followed, and in the end the suggested amendments submitted by the Secretary of the Society were approved in their entirety.

On the recommendation of the Council the resolution of the Branch of February 6th, 1908, in regard to the forwarding of reports of the meetings of the Branch to the Press was reconsidered, and it was resolved that reports of meetings should ordinarily only be forwarded to PUBLIC HEALTH, unless in the discretion of the Secretary it was thought wise to forward them to the lay local press.

The adjourned discussion on the Medical Inspection of School Children, introduced by the President's Address, was re-opened by Dr. Clendinnen, who thought children under five should not be examined. With regard to the work done by teachers, he thought it was a great mistake, as was apparently done in some places, to leave to teachers the assessment of the nutrition of children. Dr. Clendinnen discussed the minimum requirements of the Board of Education for the current year, and thought that some confusion would arise on this point; and he advocated the handing over to the National Society for Prevention of Cruelty to Children extreme cases of verminous children.

Dr. HANDFORD, concerning the matter of the children that should be examined this year, thought that irrespective of what the Board had put in the Code, the Act requires that children should be examined as soon as possible, and whatever is done must be done in conformity with the Act.

Dr. RIDLEY BAILEY raised the question as to what constituted an "admission"; were transfers admissions? This point was not clearly defined. He thought that the final examination before leaving ought not to be compulsory. He found that over 60 per cent. of girls had verminous heads. Dr. Bailey spoke very strongly against education authorities making subscriptions to

voluntary hospitals; he thought that general practitioners should be able to cope with most of the work involved in the way of treatment.

Dr. SNELL spoke of the difficulty which arose when children were grouped according to their years of birth; the results obtained were not then comparable with the standards, which were always given in ages. If this grouping were taken there would be a difference between the youngest and the oldest in each group of something less than two years, according to the date of the birthdays and the date in the year of the examination; this would not occur if the children were grouped in ages. He thought that the difficulty of the legal right to examine children might be overcome by utilising Section 122 of the Children's Act. In the Memorandum of the Board, the fourth examination was distinctly stated to be optional, but in the Code it now appeared to be compulsory. In the matter of written communications to parents, he thought that typewritten letters would be likely to receive more attention than printed notices, and they probably involved less clerical work than the filling in of printed forms and their counterfoils.

Dr. J. W. MILLER thought the final examination of the children of considerable advantage, in that sometimes valuable advice might be given the parents as to the most suitable occupation for the children. At Hereford, his Council had given him authority to have all verminous children cleansed. In regard to treatment, he thought that this should be done by the general practitioner; in the case of eye, ear, and throat cases, whose wants might in this way not be adequately met, he thought that the County might appoint specialists.

Dr. FOSBROKE spoke with regard to the admission of children under five years of age, stating that they would be much better away, though, perhaps, in the slum quarters of large towns they might with advantage be admitted. The examination of children under five he thought of no great benefit. He had endeavoured to obtain from the Board of Education their views as to the examination of children under five, but had been unsuccessful. In Worcestershire they made a note of chest measurements; the children were stripped to the waist, and no parents had objected. Although parents were invited to the examinations, he thought it wise to convey to them a report of the defects found; they then had something to show their doctors. In Bromsgrove an eye hospital had been started where an oculist advised on the appropriate spectacles; spectacles were only provided free when the parents could not afford them; in regard to verminous children, if the notices were unattended to, the children were excluded, and the parents were summoned for the non-attendance of their children. At Redditch, where the opposition was at first the strongest, parents now welcomed the examination. Dr. FOSBROKE spoke of the difficulties of harmonising the Code year with the year of the report of the medical officer of health.

Dr. HELENA JONES said that since June last she had examined 4,000 children, and she had come

definitely to the conclusion that it was the duty of the State to treat the children; she thought that parents had the right to expect this. She spoke of the monotony of medical inspection work; if this work were continued, it was likely to convert the inspectors into mere machines; the community would not get the best men or women unless they, the inspectors, were allowed more scope.

Dr. MABYN READ stated he had taken the work in a school of about 500 children experimentally. In this one examination he had found two cases of serious heart disease, and he had been able to advise parents as to suitable occupations for their children. He thought that a lot of useful information about the children could be obtained from the parents. In regard to the treatment of children, particularly those with minor complaints, he thought that this was a difficult and delicate matter; so many children received medical attendance on the contract principle that it was not easy to expect that they would receive adequate attention to these so-called minor matters; he realised the difficulty in cases of otorrhœa.

Dr. HAMILTON WOOD spoke of the difficulties of the examination of children who were leaving. When they were thirteen they could go. If these were to be examined systematically, a weekly attendance at the schools would be necessary, and this would be impossible.

Dr. EDITH OVERSBY thought that children under five should be examined. She apprehended no difficulty in the medical inspector working under the direction of the medical officer of health. In regard to nutrition, and also clothing and footwear, she thought this was best noted by the inspector and not by the teacher. Children so often went to school with their outer garments good, but with their underclothing in a filthy condition.

Dr. WEAVER thought it a very difficult matter to assess nutrition. Ill-development of the child must not be confounded with ill-nourishment. In his opinion the examination of infants was not very important at the present time, but that at seven years of age was of the greatest importance. In regard to the examination of those who were leaving, he thought that there were advantages in grouping the children according to the year of birth. In this way one would examine both those who could legally leave, and those who would leave under labour certificates. If the medical inspector asks when children are going to leave, great difficulty is experienced in getting correct information.

The PRESIDENT wound up the discussion by referring to various matters touched on. He had been greatly struck by the variability of diseases found among children. He dealt with the question of ringworm, and thought that it was a regrettable circumstance that girls wore long hair. He thought sassafras oil a good remedy for verminous heads. He very much appreciated the discussion which had ensued on his address.

North-Western Branch.—Minutes of a Meeting of the North-Western Branch of the Society of

Medical Officers of Health, held at the Victoria Hotel, Manchester, on Friday, February 19th, 1909. *Present:* Dr. W. M. Hamilton (in the Chair), Drs. Wilkinson, Buckley, Welsh, Garstang, Arnold, Corbin, Paddock, Carnwath, Hutchinson, Hibbert, Rees Jones, Thomas, Wheeldon, Holt, Greenwood, Wheatley, Sergeant, Marsden, Buchan, Hitchon, Harper and Barlow.

Minutes of last meeting were read, confirmed and adopted.

Election: Dr. A. Gibb Glass, Assistant M.O.H., Burnley, was unanimously elected a member of the Branch.

Dr. A. Sellars, Assistant to Dr. Delepine, Public Health Laboratories, was nominated for membership.

The resignation of Dr. Knyvett Gordon was reported.

The amendments to the Midwives Act drawn up by a sub-committee of members of the Society, which the president of the Society is to present to the Departmental Committee as the evidence of the Society as a whole, were considered seriatim. The Branch were of opinion, however, that in the paragraph under the heading "Scarcity" the words "if loosely interpreted there will be a new class of midwives covered by doctors (see Item 1)" should be deleted.

The following additions were recommended: (1) The Branch also was of opinion that more information necessary as to what was meant by "an investigation of her mode of practice" (Rule 23, Midwives Board) and an indication as to how this investigation was to be carried out. (2) That houses in the occupation of midwives, where expectant mothers are taken to be delivered of a child, should be registered, and that powers of supervision over such places be granted.

Dr. Thomas read his paper on "Refuse Destructors and the Public Health." Drs. Marsden, Wilkinson, Rees Jones, Sergeant and Buchan took part in the discussion, and a vote of thanks was passed to the writer at the close.

Southern Branch.—Minutes of meeting held at the Junction Hotel, Eastleigh, on March 5th, 1909. *Present:* Drs. Lauder (President), Hemsted, Loveless, Lyster, Nunn and Willoughby, with Drs. Bevan, Bartlett, Dick, Livingston, Roberts, and Walker (visitors). The Minutes of the previous meeting were read and confirmed.

Letters were received from several members regretting absence.

The transference of Dr. Hemsted from the Home Counties branch and Dr. Milburn from the Northern branch was proposed and carried.

Consideration was given to the amendments to the Midwives Act suggested by a sub-committee of the Society and referred to the Branch. The Branch agreed to support all of these with the exception of that granting to the Local Sanitary Authority the power to spend money on training midwives.

Dr. Willoughby read a paper on "Return Cases," with special reference to his recent experience with diphtheria at Eastbourne. He detailed a series of instances in which second cases had occurred in houses some weeks after the

first, and shortly before the first was discharged from the isolation hospital; and gave it as his opinion that in other instances of so-called "return cases," as in these, the infection was not derived from the patient who had returned home. The risk of this could be prevented by ensuring that the patients were bacteriologically free before discharge.

In scarlet fever the risk arose chiefly from patients having a discharge from the nose or ear; and the recrudescence of these on returning home might be avoided by convalescent wards, and by giving the final bath a day or two before the patient's return home.

An interesting discussion of the various points followed, and a vote of thanks was passed to Dr. Willoughby for his paper.

After lunch, the members were shown over the railway works of the London and South Western Railway.

Yorkshire Branch.—A meeting of the Yorkshire Branch was held at the Town Hall, Leeds, on Wednesday, the 3rd March, 1909. Those present were the President (Dr. Neech, of Halifax), who occupied the chair, and Drs. Anderson (Wortley R.), Bailey (Horsforth), Bampton (Ilkley), Buchanan (Thirsk), Cameron (Leeds), Castle (Darfield), Clark (Leeds), Coplans (Leeds), Forsyth (Birstall), Langdon (Wakefield), Martin (Brighouse Orr, Wakefield), Smith (York), Mitchell Wilson (Beverley), and J. R. Kaye (Wakefield), Hon. Secretary. There were also present, as visitors, Captain Hayes, R.A.M.C., and Dr. Greaves.

Three new members were elected, after which the ordinary business of the meeting was proceeded with.

The principal item on the agenda was the consideration of suggestions to be laid before the Departmental Committee for the Amendment of the Midwives Act.

The Circular of the Local Government Board, dated July 27th, 1907, authorising Boards of Guardians to pay the fees of doctors called in by midwives in poor cases was also considered, and it was unanimously felt that a fee should be compulsory and not left to individual Boards of Guardians.

The notification of phthisis in poor persons under the Local Government Board's Regulations of December 18th, 1908, also came under discussion, and it was resolved to ask the Central Council to take some steps to alter the provisions so that notification should be adaptable also to sub-registration areas and wards as well as to a district generally; and, secondly, that notification should not be compulsory on medical men.

The discussion on the Notification of Births Act brought forward the idea that the West Riding County Council had done right in leaving local authorities to take up the adoption of this Act themselves, at any rate for the present. The opinion was generally expressed to associate health visitors with school nursing.

Those present expressed their approval of occasionally having an agenda without a set paper, such as was presented at the above meeting.

SEASON AND DISEASE.

DR. OWEN PETERS contributed a valuable paper on this subject to the Epidemiological Society in October last.* The first part of the paper describes an investigation into the seasonal prevalence of diarrhoea and enteric fever from data obtained in the last eighteen years at Nottingham, and the conclusions arrived at are confirmed from a large collection of English and foreign statistics. Dr. Peters first shows that the seasonal rise of the above diseases is not due to the town arrival at a certain fixed temperature, and also that it is not the deep earth temperature which is the controlling factor. He infers that the cause of the summer or autumn rise of both diarrhoea and enteric fever is the cumulative effect of certain degrees of temperature, extending over a certain time. The temperature conditions as to diarrhoea are stated as follows:—(1) From the time when the rising seasonal temperature at the surface of the earth have exceeded certain limits, influences are set up which go to determine the date of the epidemic outburst of diarrhoea. (2) These influences can be definitely traced back to the attainment of 55° F., or a slightly lower temperature by the one foot thermometer, and it is possible that some slight influence is produced from a point as low as 50° F. There is no reason, however, for regarding even this point as an absolute limit. (3) The intensity of the influence is in proportion to the height of the temperature: 60° F. is the point at which what may be regarded as favourable temperatures obtain. Four or five weeks at 60°, ten weeks at 55°, and proportional periods at the intervening temperatures must elapse before the main rise in diarrhoea deaths occurs; above 60° the potency of temperatures increases.

The pro-epidemic period of enteric fever is usually complete about three or four weeks after that of diarrhoea, and its beginnings can be traced at the attainment of 52° F. by the one foot thermometer. The typhoid period can be completed at temperatures slightly lower than those necessary to produce a vigorous rise of diarrhoea. The ending of the summer epidemic of diarrhoea takes place when the air temperature drops below 50°.

In the second part of the paper Dr. Peters discusses various theories as to the etiology of diarrhoea. He apparently inclines to the hypothesis that this disease is usually saprophytic, and persons are then infected from the ground, e.g. by dust; but it becomes epidemic in the summer, and is then mainly propagated from case to case, either directly or by means of flies or other carriers. He suggests that enteric, diphtheria and scarlet fever may have a similar two-fold life history, and that mixed cases and healthy carriers are not the sole explanation of cases for which no previous personal source can be found.

Dr. Peters, perhaps wisely, ignores the difficult question of the bacteriology of diarrhoea, and whether it is one disease *sui generis*, or depends on several distinct micro-organisms.

* See Proceedings of Royal Society of Medicine, November, 1908. (Epidemiological Section.)

LAW REPORTS.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

December 9th and 10th, 1908.

BEFORE BIGHAM AND WALTON, J.J.

HAURAHAN v. LEIGH-ON-SEA URBAN DISTRICT COUNCIL.

Public Health Act, 1875, Section 159.—Conversion of a Building into a Dwelling-house—Breach of Bye-laws—Right of Council to Pull Down Building.

If a person converts a building not originally constructed for human habitation into a dwelling-house, he thereby erects a new building within the meaning of the Public Health Act, 1875, Section 159, and if he does not comply with the bye-laws relating to new buildings, the sanitary authority may pull down the whole building under a bye-law which authorises them to pull down "work" done in contravention of the bye-laws.

This was an appeal from a county court held at Southend in an action to recover damages for trespass. The plaintiff had bought land which had an old railway carriage on it, which carriage had been used to afford shelter to workmen during their meals. On taking possession of the land he converted the carriage into a dwelling-house for himself and family, and he used it as such. After various proceedings against him for breach of the bye-laws, the defendant Council required him to pull down the work, but he refused to do so, whereupon the defendants caused the whole carriage to be pulled down. The County Court Judge held that the defendants were justified in so doing, and the plaintiff appealed.

Radeliffe, K.C., and Thornton Lawes appeared for the appellant; C. H. Smith for the respondent. The Court dismissed the appeal.

WALTON, J., in the course of a lengthy judgment, said:—"I think that if work is done upon a building not originally constructed for human habitation for the purpose of converting it into a dwelling-house, that is to be deemed the erection of a new building. It seems to me to follow that the building converted must be deemed a new building. The work, no doubt, is to be deemed the erection of a new building within the meaning of Section 159 of the Public Health Act, 1875. Then the bye-laws relating to new buildings refer to the buildings as a whole, and it seems to me that Section 159 has the effect of making the whole building into a new building, and not merely the effect of rendering the work of conversion the erection of a new building. It follows that in this case there was a breach of Bye-law 10, because this building did not as a whole comply with Bye-law 10, and that under the bye-laws the defendant Council were justified in pulling it down."

BIGHAM, J., said:—"In my opinion the legislature intended that when a building not meant for a dwelling-house is altered so as to make it into a dwelling-house, the building so converted is for all purposes, under the Public Health Act, 1875, to be treated as if it were a new building. That

is the effect of Section 159. The house or building then becomes subject to all the provisions of the Act, and of the bye-laws made in pursuance of the Act, with regard to new buildings. The railway carriage, then, became a new dwelling-house. The plaintiff did not comply with the requirements of the Public Health Act, 1875, and of the bye-laws, and as he omitted to do what he was lawfully required to do by the local authority, that authority became, in my opinion, entitled to pull the whole building to pieces. (For full report, see 73 "J.P." 100.)

KING'S BENCH DIVISION.

January 14th, 1909.

BEFORE LORD ALVERSTONE, L.C.J., BIGHAM AND WALTON, J.J.

LEWIS v. WEATHERITT.

Sale of Food and Drugs Act—Milk—Warranty—Verbal Contract—Label on Churn.

In proceedings under the Sale of Food and Drugs Act, 1875, for selling milk from which fat had been abstracted, it is not necessary, in order to make out the defence of warranty, that the contract should be in writing, provided there is a written warranty on the label attached to the churn.

This was a case stated on the hearing of an information alleging that the defendant had sold milk from which 14 per cent. of the milk fat had been abstracted, so that the milk was not of the nature, substance and quality of the article demanded. The defence relied on was that of warranty under Section 25 of the Sale of Food and Drugs Act, 1875. The defendant had been supplied daily by a firm of the name of Carter with milk for some time. The original contract, which was in writing, contained a warranty, but the time for which the contract was made had expired, and the contract was renewed verbally for a further period, the milk to be supplied on the same terms as formerly. The milk in question was purchased by the defendant from the said firm, and was delivered at Waterloo Station in a churn, to which a label was attached, which was as follows:—"Date, 17. 6. 08. Milk—Urgent. To Mr. Lewis. Waterloo. 1 Churn, 17 Gallons of Pure New Milk, From Mr. R. and C. Carter's Creamery, Boscombe, Hants. Depôts:—Baily Gate, Blandford and Bournemouth." The Magistrate convicted, as he considered there was no sufficient warranty in writing.

Avory, K.C., and Eustace Hills appeared for the appellant; Courthope-Munroe for the respondent.

The Court allowed the appeal.

LORD ALVERSTONE, L.C.J., said that each delivery of milk was to be regarded as a separate transaction, and each churn had a separate written warranty attached to it. It could not be said that the statement on the label was not a warranty because the word "warranted" was not used.

BIGHAM, J., in agreeing, said that in order that the defence of warranty may be made out it was necessary for the defendant to show that he bought this milk as pure milk, with a written warranty to that effect. With each churn a warranty was given, and he was of opinion that with each churn there was a sale of milk with a written warranty.

WALTON, J., concurred.

UNSOOUND MEAT.—At Woolwich, on November 23rd, before Mr. Hutton, the New Zealand Meat Company, of the Central Meat Market, E.C., was summoned, at the instance of the Woolwich Borough Council, for having supplied meat, under contract to the workhouse of the Woolwich Union Guardians, which was afterwards condemned as unfit for the food of man. The Town Clerk prosecuted, and Mr. H. Ricketts defended. The defendant company had entered into a contract with the guardians for the supply of meat to the workhouse, and on October 1st, sent a quantity of meat, in which were four clods of beef which the workhouse master, upon examination, found to be in a state of putrefaction. He communicated with the contractors, whose manager proceeded to Plumstead, and on seeing the meat made arrangements to send in from a local butcher sound meat in substitution, and said that he would accept the rejection of the unsound meat. Later a sanitary inspector seized the meat and took it before a magistrate, who condemned it and made an order for destruction. For the defence a mass of expert evidence was called to prove that boned meat, such as clods, was more liable to become putrid than meat containing bone, and that on the day in question the weather conditions were peculiarly unfavourable for meat, one result being that a very large quantity was condemned at the Central Markets. Employes of the firm stated that the meat was sound when it was despatched from the market. The magistrate said he had come to the conclusion that the defendants did not know that the meat was unsound, and that no sale had taken place. The summons would be dismissed.

HOUSE OR TRADE REFUSE.—At the Mansion House, on November 24th, the Corporation of the City of London were summoned by Messrs. J. Lyons & Co., Limited, for failing to remove the house refuse from their premises, No. 31, Poultry, contrary to the 30th section of the Public Health (London) Act, 1891. This was a test case as far as tea shops and restaurants in the City were concerned. The point at issue was whether certain refuse produced in the course of the business of Messrs. Lyons, Limited, the refreshment purveyors, at their depôt in the Poultry was house refuse or trade refuse. If it were house refuse it was the duty of the Corporation, as the sanitary authority, to remove it gratuitously, but not if it were trade refuse.

The magistrate dismissed the case, stating that he would welcome a decision of the High Court on the point; notice of appeal was given.

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DR. McVAIL'S REPORT ON POOR LAW MEDICAL RELIEF.

THE Report of the Poor Law Commission has been followed by the issue of an important appendix, which consists of Dr. McVail's report on "Poor Law Medical Relief in Certain Unions in England and Wales." To medical officers of health this report is of special interest. The author is one of the most distinguished members of the public health service, and in his report, with its broad outlook, its discriminating selection of essentials, and its minute thoroughness of treatment, he has produced a document which is a model of its kind. Dr. McVail not only sets forth the general results of his inquiries and the conclusions to which he has been led, but he also states in detail the facts upon which his conclusions are based, and in the appendices he reproduces the actual notes taken during his investigations. The report possesses in a high degree the chief essential of a medical document—it is a storehouse of facts; and it must be confessed that the facts reveal grave shortcomings in our system of Poor Law medical relief. Of the work of the Poor Law medical officers themselves Dr. McVail has much to say in commendation. In spite of miserably inadequate salaries, which in the case of many district medical officers work out at from 3½d. to 5d. or 6d. a visit, and of much work for which no remuneration whatever is received, the Poor Law medical officers have done and are doing work of which the profession may be proud. But the system under which the work is done is highly unsatisfactory, not only to the patient and the doctor, but also to the community. The Poor Law medical officers serve authorities which, as Dr. McVail points out, are composed of persons who "have not the knowledge requisite to enable them to exercise any skilful or expert supervision over the work of the medical officers whom they

appoint, nor to appraise its proper remuneration"; inspection by the Government is altogether inadequate, and in the case of outdoor medical relief non-existent, and the whole scheme of relief is framed without reference to the larger interests of the community. "Persons suffering from the most serious transmissible maladies are afforded relief without prevention of opportunities to inoculate the healthy or contaminate the next generation. Phthisis cases are maintained in crowded, unventilated houses, where there is unrestrained facility to convey the disease to their offspring. Diabetes cases live on the rates and eat what they please."

Dr. McVail's recommendations are, broadly, on the lines suggested by most of the medical officers of health who gave evidence before the Commission. He is strongly in favour of a transference of the medical functions of the Poor Law authority to a reorganised Public Health authority. He urges that the work should be regarded primarily from the point of view of prevention, and he points out that the preventive principle is capable of very wide application. Unlike the Commissioners who have signed the Majority Report, he holds that the control of "pauper phthisis and phthisical" families and their homes should be placed under the health authority, and he goes on to say that "while phthisis is specially important, yet the early stages of disorders of all organs of the body—heart, lungs, kidneys, digestive system, brain and the rest—often furnish indications for preventive measures." In a special memorandum on home medical inspection, Dr. McVail explains in some detail a scheme of preventive medical work, in which the medical attendant of a family would make periodical visits to the house to examine the inmates and advise them as to their general physical health and well-being. This interesting and suggestive memorandum, like the whole report, deserves the sympathetic study of every medical officer of health.

THE ADMINISTRATION OF SCHOOL MEDICAL INSPECTION, ESPECIALLY IN COUNTY AREAS.*

By T. H. CRAIG STEVENSON, M.D., D.P.H.,
School Medical Officer to the Somerset
County Council.

THE administration of school medical inspection forms a problem with which I take it many of us are at present struggling, and which probably none of us has yet solved to his entire satisfaction. My present aim is not to attempt a dissertation upon its theory and practice, for which I am by no means qualified, but rather to put before you some of the methods in use or proposed for adoption in my own area, and examine them in the light of the experience gained during the first year's working of the new Act and of such acquaintance as I have been able to obtain with the methods used for the same purposes elsewhere.

I must here, while expressing my regret that this acquaintance with the methods of others is so limited, record my obligation to all those school medical officers who have, at no slight trouble to themselves, communicated to me the particulars of their routine, as well as to Dr. Newman for valuable help and advice.

The comparison of various schemes, as well as the consideration of the problems presented by the working of the Act in my own area, has suggested a number of points for discussion to which I hope to direct your attention; and, however incapable I may be myself of solving these problems, I shall feel that your time has not been altogether wasted if some of the many very debatable questions involved receive adequate discussion at the close of this paper.

After considerable hesitation as to method of arrangement, I have decided to group the various points discussed under three headings according as they refer (1) to arrangements made preparatory to the actual inspection, (2) to the actual inspection itself, or (3) to the utilisation of the results of inspection.

I. PREPARATION FOR INSPECTION.

There are only a few points to which I wish to refer under this heading.

ASSISTANCE BY TEACHERS.

The first step in all cases is to communicate with head teachers requesting their co-operation and describing the form which it is

desired that this should assume. It seems to be generally felt that there is so much information and assistance for which the teacher must be looked to that the work asked of them should be kept as light as possible consistently with efficiency of inspection. It is well to make it plain that this is being done, and, if possible, to convince leaders amongst them officials of their local unions and so forth, of the fact, and so secure their confidence. Probably most of us have endeavoured to discuss the new work with teachers at their periodical meetings. In Somerset, I am glad to say, a resolution pledging hearty co-operation was passed by the annual meeting of the teachers of the county at an early stage. Doubtless, however, after the first visit or two we are judged in this matter rather by our performances than our promises, and I think it important, therefore, never to ask a teacher to do anything unless it can be shown that it is necessary, and cannot be done as well by any one else.

As the result of a year's experience, I have just re-drafted the instructions issued to teachers in a considerably amplified form. Even at the risk of making these undesirably lengthy, I have found it necessary to be explicit as to all details. In addition to the full set of instructions, designed for preservation by the teacher for future reference, we also find it desirable now to send out a *résumé* of the principal points to be borne in mind by him in preparing for an inspection, appended to the form of notice of a proposed inspection.

NOTICES OF INSPECTION.

In addition to the notice to teachers we have found it necessary to provide for no less than three, or in some cases four, other notices of proposed inspections to be sent out by the medical inspectors.

A postcard is sent in each case to the correspondent of the school. The other notices may take the form of programmes, each covering a number of inspections. One is sent to me, another to His Majesty's inspector, and another to any district nurse engaged to assist in inspection and after-care at any of the schools concerned.

The list sent to me is gradually filled in with the numbers inspected as the cards come in, and thus part-time inspectors, who are paid in our case by a fee per child inspected, are spared the trouble of making out claim sheets for payment.

Probably at the same time as the introductory

circular is sent to teachers, measures are taken to secure that the accessories necessary to inspection shall be on hand when required. These are principally (a) inspection cards or schedules and other stationery, (b) vision testing cards, and (c) apparatus for weighing and measuring. In our case they also include (d) a supply of wooden garden labels for use as tongue depressors (taken by the inspector).

WEIGHING MACHINES.

In rural areas it has to be decided whether to provide a weighing machine for each school or to arrange for the transport from school to school of portable machines as required. The decision must be made largely on financial grounds, but there are advantages in having a weighing machine in each school which, in my opinion, should decide in favour of this solution even if the expense involved were considerably greater. It is well to stimulate an interest on the part of teachers and pupils in the records taken, and this is much more likely to arise if the means for taking the records are always at hand. It is also important in some cases to have periodic weighings between inspections. For this purpose we have just issued a height and weight card to all schools. This fits the ordinary cabinets, and has spaces for twelve monthly records of the height and weight of nine boys and nine girls. When the inspector for any reason wishes to have a child's record taken in the interval between inspections, he will put the name on the card. The weighing and measuring will occupy very little time, as all can be done together at the first of the month, and there will probably be few names on the card in any one school or department. The records, of course, need not in all cases be taken so frequently. This work, quite impossible if there is not a weighing machine in the school, will, it is hoped, prove of interest to the teachers, as it will enable them to associate the weight with the physical well-being of the child much more closely than records at three-yearly intervals, and also will probably stimulate the interest of some teachers at least in the subject of physical measurements further work in this direction. Of course the work of the teachers in obtaining these records is entirely voluntary.

So far as my information goes, the provision of weighing machines for each school is not only not more expensive but is actually

much cheaper than the other alternative. Dr. Middleton Martin has kindly furnished me with figures relating to Gloucestershire. Here there are 396 schools with about 50,000 children. The expense of transporting weighing machines and measuring standards amounts to about £50 per annum. In Somerset we have 500 schools (60,000 children), so presumably the cost to us might be about £60 to £65. Weighing machines and standards have been provided for each school at a cost of about £600, the annual charge in respect of which for interest and depreciation cannot well be reckoned higher than £30 to £35, only half the cost of the other system.

An advantage incidental to the use of portable weighing machines is that tests of their accuracy are much more easily arranged.

TEACHERS' ENTRIES ON INSPECTION CARDS.

There is room for considerable difference of practice in the extent to which teachers are asked to fill up the schedule in anticipation of the inspection. In addition to the entries, such as age, standard, attendance, personal and family history, etc., which fall naturally to the teacher, there are two groups of entries which may be allocated either to teacher or inspector, or both in co-operation. The first consists of observations which cannot be assessed by a fixed scale, and includes those relating to cleanliness, clothing and mental capacity, while the second includes height, weight, vision (and possibly hearing), which are so assessed. With regard to the first group, the objections to placing the matter in the teacher's hands are that he is unacquainted with the standards adopted in other schools and that he has not the same opportunity as the inspector of making searching examination as to cleanliness and clothing. On the other hand, the inspector only sees the child's skin and clothing as prepared for inspection, when their condition may be very different from that which they usually present, and can scarcely be expected to give an opinion on the mental capacity of a normal child which would compare in value with that of its teacher. A solution which has come under my notice is that of allocating clothing to the teacher and cleanliness to the inspector, but it appears to me whoever is most competent to judge of one is also most competent to judge of the other.

The system I have adopted from the first, and found to give fairly satisfactory results, is as follows: The teacher makes all the entries

* Read before a meeting of the Society of Medical Officers of Health on February 12th, 1909.

relating to cleanliness, clothing, and mental capacity in advance, but in pencil. The inspector thus has before him the teacher's report of the child's usual condition, and considers this as well as his own observations of the child's condition at the moment of inspection in making the final entry, in ink. It is quite impracticable to question teachers on these points at the time of inspection and in the presence of parents, and I feel certain that if reliance is placed upon either teacher or inspector alone in these matters many mistakes must be made. Of course, if notice of inspection were not given, the inspector's observations should suffice, but the advantage on other grounds of giving notice and inviting parents far outweighs this disadvantage. As to mental condition, I always accept the teacher's report unless I discover his standard to be unduly high or low (generally the latter) or there is reason to suspect possible mental deficiency.

The practice with regard to the second group of observations referred to seems to vary greatly. No difficulty can arise here as to standard, but the very definiteness of standard entails increased demand for accuracy. In some areas the teacher is requested to record height, weight, and vision in advance, and in others they are recorded by the inspector. I think that at first, at all events, they are better left for determination at the time of the medical inspection.

2. CONDUCT OF INSPECTION.

As on the other hand it is important to interest the teachers in these matters, the inspection should be so conducted as to give them such a training as will fit them to take these records by themselves later on. With this object I generally ask the teacher to take heights and weights, explaining the use of the weighing machine when necessary. The results so obtained must be carefully scrutinised, and, when necessary, checked by the inspector, who is held responsible for them. To show the necessity for this supervision (as well as the difficulty of delegating the matter entirely to the teachers in the first instance) I may mention a school from which reports on a number of infants were received lately, all of whom weighed over 30 kilos! Many teachers require little or no training, and they are often found to have taken the records without being asked, but also, as a rule, without removal of boots.

TESTING OF VISION AND HEARING BY TEACHERS.

There has been much difference of opinion as to whether vision tests should be made by teacher or medical inspector. I notice that in America the former appears to be the prevalent practice, both for vision and hearing, and it is even maintained that teachers can make the tests more efficiently, as the children are likely to do themselves more justice, being more at their ease with teachers.* I think that the results of successive tests of the same children in London by teacher and by medical officer, as published by Dr. Kerr year by year (pages 51 and 52 of his Report for 1907), are an eloquent commentary on this claim, so far as vision is concerned, and in the case of a test where the personal factor must bulk so largely, as the whisper test for hearing, it seems to me that the fewer variables in the shape of "forced whispers" of differing volumes introduced into the tests the better. I have not as yet, therefore, asked teachers to undertake the hearing test, though I sometimes do so for vision, but in this case all who do not read 6/6 are of course re-examined by the medical officer. When the teacher does not himself undertake the test he is present, sees it carried out, and often assists, as by pointing to letters for young children. I hope that before long all teachers will have seen enough of the work to be able to sift out the children with full distant vision, and I do not think that more should be looked for from them.†

FULLER EXAMINATION OF CHILDREN WITH DEFECTIVE EYESIGHT.

The fuller examination at a later date of children whose vision is below 6/9 is enjoined by Circular 582 of the Board of Education. In a large rural area the fulfilment of this injunction presents considerable difficulties. Hitherto, we have only been able to advise these children's parents to take them to an oculist. This is unsatisfactory advice to give to the wives of agricultural labourers, but it was impracticable to attempt the "fuller examination" of these cases in their schools, even if all the inspectors had had the necessary skill. Now, I am glad to say, arrangements have been made which seem to me to meet the

* Gulick and Ayres' "Medical Inspection of Schools," p. 105.
† The London figures seem to me to show how necessary it is that the teachers' results with regard to children reported defective should be checked, as the proportion of cases of bad sight returned by them is in every instance considerably higher than that by the medical officers. The relation between the two sets of figures is a remarkably constant one, the teachers every year, and at all ages, returning from 25 to 50 per cent. more cases than the oculists. This, I argue, shows that the teachers are not more but less successful than the medical officers in eliminating psychological sources of error.

difficulty in the best way possible for a rural area, much of which is far distant from any large town. A full-time officer has been appointed who has had considerable experience in ophthalmic work, a qualification to which consideration was given in determining his salary. He will undertake the ordinary routine inspection in certain districts, and will, in addition, act as "school oculist" for the whole county. Eye-testing centres are being established in conveniently situated schools throughout the county, to which children found to require "further examination" will be gathered periodically to meet the oculist. As it is found that the only fixture which need be provided at the school is a dark blind, or blinds, the number of these centres need be limited only by convenience, and it is hoped that there will be little difficulty in getting the children to them on market days. The oculist, when he examines the child, will, if necessary, prescribe spectacles, which a contract will enable the County Council to sell to the parents at a very low figure. The Council has also obtained power to provide spectacles without charge, but hopes that the cases where this is necessary will prove to be few.

My reason for describing these arrangements is that they appear to me the best solution of an otherwise difficult problem. Reference to hospitals is unsatisfactory, both because the hospitals do not want the cases and because in the country it is almost impossible to get the cases to the hospitals. A genuine attempt to do so, by offering to pay fares, etc., would probably be much more expensive than our present arrangement. And if the recent London committee recommended clinics for the purpose there, where the hospitals are at hand, they seem to be much more necessary in the country, for such cases, at least, as do not require continued attendance.

SYMBOLS.

The question of using symbols for recording the results of inspection merits some consideration. I find that the majority of the authorities of whose schemes I have particulars, do not provide for their use, but that a considerable minority do. They have been in use in Somerset from the first, and I am convinced that their employment is advantageous, for several reasons:—(1) It greatly facilitates classification and tabulation of results, as it ensures that the child is reported under each head as coming definitely within one or other

of a small number of classes, generally three. (2) It ensures the terseness and definiteness of statement so essential in reports of this kind. (3) It causes great saving of clerical labour in filling up the card. (4) A smaller card suffices where symbols are in use.

There are also dangers connected with the system, though I think they are far outweighed by its advantages. Perhaps the chief is that there is in some cases a tendency to the mechanical repetition of the most frequently recurring symbol, without due regard to the facts of the case before one. But I should imagine that this would apply with almost equal force to any other constantly recurring form of report. The conscientious inspector will be conscientious, and the careless man careless, whether he uses symbols or not.

The symbols must be readily understood by teachers, as the latter must be encouraged in every way to familiarise themselves with all the facts entered on the card. This can easily be secured by supplying them with the key to the symbols in use, and by adopting as simple a code as possible. For this reason I deprecate the use of abbreviations as symbols. As well as taking longer to write they make the code much more complicated by greatly increasing the number of symbols. Most entries which are capable of expression by symbol at all can be divided into three classes: good, indifferent and bad. We have found the use of letters A, B and C to indicate these three classes of entry, whatever the subject concerned, quite satisfactory. Where it seemed advisable, limits have been assigned in our code to these three classes, but this would have been necessary in any event.

There is one pitfall in the use of symbols so obvious that I should not have alluded to it but that I find it has not always been avoided. I refer to the use of a blank space as a symbol, e.g., to imply that a child is clean. This appears to me very bad practice, as it makes it impossible to say in any given instance whether the child was actually reported as clean, or whether the inspector forgot to make an entry, as most of us, I imagine, do at times forget.

I would also urge that symbols should only be allotted to conditions which are likely to be noted with a fair degree of frequency. Little can be gained by the use of a symbol to describe a condition which may not be met with once in three months. When it does turn up most inspectors will either have forgotten

that there is a symbol allotted at all, or if this is remembered it will probably have been forgotten what the symbol is. And to understand the report upon the child, the teacher must have to decipher a regular cryptogram. I use symbols sparingly for pathological conditions, allotting them only to a few of the most frequently met with, such as enlarged glands and tonsils, adenoids, otorrhœa, etc. Conditions less frequently met with are in my opinion much better described in writing.

For this purpose, seeing that no code, however elaborate, can provide for everything that needs to be said in very many cases, I regard it as of the utmost importance that a considerable proportion of the inspection card or sheet should consist of blank space for whatever notes are found necessary. By the avoidance of waste this can be arranged for even on an 8 in. by 5 in. card, a size which I find sufficient, and think likely to be much less cumbersome than larger cards or bulky schedules.

I find that most authorities regarding which I possess information have preferred the card to the folding schedule, or the printed sheet on the loose-leaf principle. In this I think they are well advised, the card possessing an ease of manipulation and general handiness which the others cannot rival.

All the entries which the medical inspector requires to make in the case of a normal child are easily expressed by simple symbols, which occupy only a very few seconds in the writing.

EXTENT OF EXAMINATION.

Our routine includes exposure of the front of the chest sufficient for examination of the apices of lungs and heart, which is carried out in all cases. On the whole, I think it is better to include this in the routine examination for the following reasons:—(1) I believe most parents like it, and would not form nearly so high an estimate of the value of the inspection were it omitted in all except special cases; (2) much more information is obtained of the child's clothing, cleanliness, and nutrition than would otherwise be available; (3) heart lesions frequently, and pulmonary lesions occasionally, reveal themselves during this examination, which would otherwise have remained undetected owing to the absence of anything in the child's appearance which could give rise to suspicion. It is true that, in young children especially, an examination that stops short at the apices of the lungs leaves much to be desired, but a more complete

examination, as a routine measure in all cases, would not repay the time expended upon it.

The rate of inspection, where the teacher's co-operation is efficient, has in our experience been about ten children per hour. Different men vary, of course, in this matter, but on the whole the output of our twelve different inspectors, with one or two exceptions, has been much more uniform than I should have anticipated.

EMPLOYMENT OF SCHOOL NURSES.

A nurse, if constantly engaged in the work, can save the inspector's time appreciably. Where, on the other hand, a district nurse attends only the few inspections held at the one or two schools in her own district, our figures do not show that her presence materially increases the rate of inspection.

Her assistance, however, may be of great value from another point of view. Our arrangement with district nurses has been that for a moderate inclusive fee (5s. per inspection) they should attend and assist at the inspection itself, and afterwards, as their ordinary rounds give opportunity, call at the homes of children requiring treatment with a view to persuading the parents to have it carried out. An inquiry into the results of treatment at two comparable groups of schools, the one visited in this way by district nurses, and the other not, showed that 39 per cent. of the recommendations for treatment made at the first group of schools had been satisfactorily attended to, as against only 22 per cent. at the other group where no nurses attended. Encouraged by this result, the County Council has now obtained the sanction of the Board of Education to put this service, previously experimental and very limited in extent, on a permanent and general footing.

It appears to me that it is by her influence in the children's homes that the district nurse can chiefly be of service in our work, and that a full-time nurse, directly employed by the education authority, though of much more assistance during the inspection, might not be able to follow it up as effectively. I notice that good results have been attained in various places by full-time nurses, but in rural areas they would necessarily be so much on the move that they could hardly acquire much influence with parents.

On the other hand, the directly employed, full-time nurse is essential for another purpose, namely, the eradication of vermin. Very many districts are without nurses, and where there

is a nurse her employers often refuse their consent to her engaging in this work for fear of the unpopularity which association with prosecutions might entail. Hence there are, in Somerset at least, very few schools where a district nurse is available for the purpose, and in the few instances where the attempt has been made to work a cleansing scheme by means of the district nurse a disposition has always been shown to "back out" when the matter of prosecution had to be considered. Other objections to the use of district nurses in this capacity are that, dealing with only one or two schools, they cannot attain the same familiarity with the condition, and the moral and material means of combating it, as the woman who is devoting a large part of her time to the matter, and that, occupying as they do fixed posts at a distance from the controlling office, they cannot report except in writing, and their work is on that account alone much more difficult to supervise.

Perhaps, in the future, it may be possible, by entrusting to school nurses various duties not directly connected with medical inspection, to limit their areas to such an extent as to enable them to acquire local influence comparable with that of the present district nurse. In addition to all the duties now entrusted to health visitors in towns, might not the school nurse very appropriately undertake those of the school attendance officer? The functions of the two officials must constantly overlap, and information acquired by the one would be of the greatest service to the other.

In this plan, if practicable, might perhaps be found, to a large extent, the solution of one of the great difficulties connected with medical work in rural schools. The number of inspectors must be limited if efficient work is to be done, so the area allotted to each must be considerable. The medical inspector, therefore, cannot be available to advise the teacher from day to day as to the exclusion of children for infectious disease and other similar matters on which teachers must frequently stand in need of advice. It has been suggested that local medical men should be appointed for this purpose, as is so frequently done in America by districts which carry out no other form of medical inspection, leaving the systematic inspections to a small number of men with large areas. Short of this duplication of medical officers it seems likely that the objects desired could be in

great part attained if the services of a trained school nurse were always available.

3. TABULATION AND UTILISATION OF THE FACTS RECORDED.

The organisation of this part of the work is no less important than that of the inspection itself. It is, indeed, even more essential that it should be carefully thought out by the school medical officer. For whereas faults in the system adopted for actual inspection will readily reveal themselves, and the methods in use are constantly subject to the criticism, expressed or implied, of all who are called upon to adopt them, only those who carry out the office routine can have any complete acquaintance with it. Faulty methods may therefore escape criticism for a long time.

IMPORTANCE OF OFFICE ORGANISATION.

I am more and more convinced that the value of the work done in the schools depends very largely on that of the work done in the office. The reports received, taken as a whole, form a mere invertebrate mass of disconnected statements. They are raw material, from which the greatest possible number of useful finished products has to be elaborated with the greatest possible promptitude. Until order has been evolved out of the chaos which is received, no adequate idea can be attained either of the general condition of the children or of the value of the reports which are coming in. Success in securing practical results to the individual child from the inspection must also depend chiefly upon what is done with the card after it leaves the inspector's hands.

For these reasons I regard it as of the greatest importance that an adequate clerical staff should be provided. Taking the average number of separate facts recorded per child inspected at, say, twenty, the number which has to be dealt with in a large town or moderate sized county, where, for example, 25,000 children are inspected per annum, amounts to half a million, a number which only experience can appreciate. Contrasted with such figures as these, the numbers dealt with by a medical officer of health in his annual report appear almost trifling. But this work of tabulation forms only a minor part of the total office routine. In rural areas, at all events, it seems necessary that copies of some, if not all, reports received should be kept at the office, and the correspondence in my own county, with its 500 separate schools, is found to assume unexpectedly large proportions, which are added to

with every step taken towards the practical utilisation of the results obtained.

On the question of keeping copies of cards I would only say that it appears to me unnecessary, and therefore wasteful, to keep a copy of every card received. The individual normal card is of no particular interest, and a copy made of it is likely to be very little referred to. I think it quite sufficient to keep copies of the cards of abnormal children, but find it very difficult to draw the line between the two. It seems likely, however, that in the future we shall copy fewer cards rather than more.

METHODS OF TABULATION.

For reasons already stated, it is most important that tabulation should progress steadily throughout the year, and should keep pace with the receipt of reports. In this way the annual report is built up in sections and some of the congestion of work otherwise incidental to its preparation at the commencement of the year is avoided.

The method of tabulation most commonly adopted appears to be that of a register sheet, on which are written the names of all the children of a given age and sex inspected in one school, with the items from the card or schedule following the name in one long horizontal line. The entries under any one head therefore form a vertical column, and it is easy to count up in such a column how often each of the possible entries, frequently three, appears. These sheets summarise the facts for single schools.

Another plan, and the only one of which I have personal experience, is that of having a sheet with a space for every possible entry at each of the routine inspection ages. A dot is made in the appropriate space for each item in the child's report, sex being distinguished by colour and position of dot. When a report is required a line is drawn to distinguish dots reported on from those which may be added afterwards. In practice, numbers are often used instead of dots, a batch of five or ten cards being entered up at once. This method is more rapid than the register sheet and has given good results in practice. From fifty to sixty or even seventy cards can be dealt with, and the school summaries at the same time entered up on district summarising sheets (the next stage to be referred to) in an hour, when the schools are not very small. By checking the totals of the entries under each head with the number of children examined, and noting

(in a separate space) any children not reported upon under any heading, great accuracy can be obtained. If any error does creep in it is easily traced when the figures are summarised for report.

This system is much more convenient for small schools than the register system, as a single sheet suffices for all the children in a school. In using the register system it would be very inconvenient to have to start a fresh sheet for each inspection age in the two sexes (six sheets per school this year) for schools with often less than a dozen children inspected altogether. I have therefore had printed a sheet which is more compact than those on the market but which is divided into three horizontal portions for the three inspection ages by repetitions of the headings. Two of these sheets will suffice for any school with less than about 200 children, and for the very small schools a single sheet may be used if desired, sex being distinguished by colour of ink. Other plans, which I am not in a position to discuss, are (3) that of dealing the cards for each heading reported upon and counting the separate groups of cards obtained, and (4) tabulation by contract with the patentees of the tabulating machine, or by other mechanical means.

The reason that has determined me to make trial of the register system, notwithstanding my satisfactory experience of the spaced sheet, is that it possesses one very great advantage shared by none of the other systems considered. It preserves the identity of the records as each referring to a particular child, and so enables one at any time to find the relation existing between any one set of circumstances affecting the children and any other set. For instance, as pointed out to me by Dr. Crowley, of Bradford, to whom I am much indebted for assistance in this manner, it is possible to ascertain from registers whether adenoids are proportionately commoner amongst children with bad boots than amongst children with good. Under the other systems this can only be ascertained of schools, *i.e.*, whether schools where footgear is bad present an unduly large proportion of adenoids, or any other abnormality. This is not quite the same thing, though probably in practice it would answer the purpose. For the man who does not desire to work out such conundrums, or who, perhaps wisely, is content with the school as their basis, especially if he has numerous small schools to deal with, the

method of dots and spaces has much to recommend it. The register, however, is decidedly the more perfect system of the two, especially as it entails the keeping of a partial copy, in another form, of each card received, and should thus diminish the number of cards to be copied where this is only done in the case of selected cards. For these reasons I intend to adopt it in place of the other, unless it is found to be very much slower.

The district summarising sheet is on the same plan as the register, with one important difference. As varying numbers have now to be added and not merely units, the entries in any column must each have the same significance. In the column of the school register a bad mark for cleanliness of body may alternate with a good one, and the number of each can easily be totted up; but in the district register it is necessary to have separate columns for each of the possible markings under such a heading as cleanliness of body. This can be arranged on a sheet of moderate size by the use of suitable squared paper.

If tabulation is kept up in this way as cards are received, all that needs to be done when a quarterly or other interim report is called for is the addition of the figures for separate schools on the district sheets, a line being drawn to mark off the last school included in the report. The totals so obtained are dealt with precisely as were the school totals on a sheet for summarising the district totals into a grand total for the whole of the area. If this is done, say, four times a year, all that has to be done at the end of the year is to add together the items of the four quarterly reports for the annual report.

TABULATION OF HEIGHTS AND WEIGHTS.

The tabulation of heights and weights demands separate consideration. If the mere presentation of averages is desired, the totals can be obtained by adding up the columns in the register sheets, and averages can then be obtained from the totals. If, however, one desires to be in a position to estimate the significance of the records, they must be presented in a different way. In order to calculate standard deviations, etc., it is necessary to record the number of children of each individual height or weight measurement. The form I find convenient for this purpose is a specially prepared sheet of squared paper, on the margin of which schools are entered in vertical sequence. Each vertical column of squares to the right of the margin is headed with a

number, from 80 to 165 (centimetres) on the height sheets, and from 10 to 59½ (kilos and half kilos) on the weight sheets. When the heights of four—five-year old boys, say, are being tabulated on the sheet devoted to that age and sex, a dot is made in a square in the column headed 102 for each child measuring 102 centimetres. At the end of the year the dots in each square are counted, and the figure representing the total written in. These figures are thus obtained in position for adding to obtain district totals for individual measurement. These sheets are each used in the form of books, each district having a separate book assigned to it in which the records of its schools for a number of years can be conveniently preserved.

GROUPING OF HEIGHTS AND WEIGHTS AT DIFFERENT AGES.

It seems worth while to endeavour to obtain a simple method of statement of the average heights and weights of all children inspected at any one school. The ordinary results can only give averages for small sections of the school, say for girls aged twelve or boys aged four, and so school cannot be compared with school except in these small sections. If, however, the heights of all the children inspected in a school can be grouped for representation by a single "figure of merit," it becomes easy to ascertain the exact position of that school in relation to others, and to arrange all the schools dealt with in order of height or of weight. The method suggested for this purpose involves the tabulation of measurements in the form described above. The significance of a deviation from the mean of say, 5 cm. differs greatly at different age periods, the range of variation increasing with age. From the records referred to it is easy to find the average deviation from its mean for each age and sex group in the whole county or borough. By correcting the recorded total deviation of each group in a school in conformity with these average deviations for the whole area, its value can be standardised to that for any one group of children taken as a standard. These corrected deviations, being all comparable, can now be assembled to obtain the average deviation of the whole school from the county or borough average, and so all the schools dealt with can be arranged in order of the general height or weight of their children. Suppose, for the sake of illustration, it is ascertained that the average deviation throughout the county from

the mean for boys of 4-5 is 2 cm., for boys of 7-8 is 4 cm. and for boys of 12-13 is 6 cm., it is evident that the significance of equal deviations in the three groups is 3, 1½, 1. Hence deviations in the first group have to be multiplied by 3, and in the second by ½, the third group being taken as the standard. When this is done the whole of the products can be summed to ascertain the average corrected deviation for all the boys dealt with in the school—a figure which is comparable with that similarly ascertained for any other school. The figures relating to girls can be dealt with in the same way to render them also comparable with those for boys aged 12-13, and it is easy to combine the figures for boys and girls so as to obtain a single "figure of merit" for the whole school.

It appears to me that heights and weights if dealt with in this way would be much more interesting than if not so treated, as everyone interested in any school could see exactly how that school compared in respect of physical development with each and all of the other schools dealt with. The labour involved is bound to be considerable, but with adequate clerical assistance it need present no insuperable obstacle, and of course if schools are too numerous to be dealt with separately they can be grouped for the purpose.

So much for the mechanism of tabulation, as to which my excuse for a detailed and, I fear, tedious, description of the methods which I happen to have adopted must be the facts (1) that at a time when the first annual reports upon the working of the new act are in course of preparation, the selection of suitable statistical methods must be matters of concern to many administrators, and (2) that however faulty the methods described may be, it is only by describing a method of some sort, and subjecting it in all its imperfections to the criticisms of others, that one can promote the discussion and comparison of methods from which survival of the fittest is likely to result.

The importance of prompt tabulation for all reports as received has already been referred to, but it merits further illustration. I regard it as essential for two important purposes: the estimation of the value of each inspector's work, and the standardisation of methods of inspection and reporting.

TABULATION AS AN INDEX OF THE VALUE OF THE MEDICAL INSPECTOR'S WORK.

With a statistical summary of each inspector's recent findings before him, the organising

officer is in a position to ascertain the personal factor of each worker and to point out to him, if necessary, which of his methods or standards have been found to yield results at variance with the common experience elsewhere, and therefore probably require modification. If one inspector returns 45 per cent. of girls inspected as having verminous heads and the inspector in an adjoining and similar district only 5 per cent. it may fairly be inferred that the latter's inspection is lax in this particular.

I believe, indeed, that the head returns form a useful statistical index of the care with which inspection is carried out. The observation, it is true, demands no medical skill, but a far larger number of faulty returns is, I believe, due to want of care than want of skill. The man who takes the trouble to employ to the best advantage a moderate scientific equipment is likely to make a better inspector than he who, with more skill, is careless in its application to such work as ours. This statement, of course, amounts merely to the repetition in another form of the old aphorism that more mistakes are due to carelessness than to ignorance, but the saying seems to apply with particular force to school medical inspection. The head returns have a double utility in this connection. • The less careful observer is liable (1) to overlook slight degrees of the conditions referred to, and (2) to exaggerate in his returns the difference between the sexes, for there is greater liability to error in dealing with the male sex. The returns for Somerset for 1908 may be quoted in illustration. Circumstances led to the more careful inspection in this particular of one approximate half of the county (Area A) than of the other (Area B). In area A 4,150 elder children were inspected, 2,029 boys and 2,121 girls; 11·6 per cent. of the boys were found to be verminous (nits) and 48·9 per cent. of the girls. In Area B the corresponding numbers were 1,869 boys and 1,984 girls, with 2·1 per cent. of boys verminous and 27·3 per cent. of girls. The same feature appears also in the returns for male and female infants. I think that those of us who are engaged in the actual conduct of school inspections must have noticed how much more easily nits, if not very numerous, escape observation in the short hair of boys than in the long hair of girls, and that with increased practice in observation the number of cases returned increases more proportionately for boys than for girls.

Additional statistical indexes will readily

suggest themselves, and very likely similar differences for the two sexes may manifest themselves in some of them. Where such differences exist, the value of the test must be greatly increased.

TABULATION AS A MEANS OF SECURING UNIFORMITY OF STANDARD.

I do not wish to suggest that a system of frequent and prompt statistical returns is of use in connection with the work of individual inspectors chiefly for the purpose of detecting carelessness. It is inevitable that where a considerable number of inspectors are at work in widely scattered localities there must be great differences between the methods and standards adopted, unless great care is taken.

Where the workers are few they can be assembled periodically for Saturday conferences at which difficulties can be discussed and differences of practice reconciled. This is an incidental advantage attaching to the appointment of full-time inspectors, though whether the advantages or the disadvantages, taken as a whole, of this system are the greater is a matter I do not discuss. It is certainly the more convenient system for the administrative officer.

The differences referred to, which must tend to occur with the most careful work, are best detected and controlled by scrutiny of the periodic statistical returns. Those summarising each inspector's own work might well be sent to him periodically along with a copy of the quarterly or other report in which the results for the whole area are summarised, in order to draw his attention to the peculiarities of his own practice. The following table, selected at random from our returns for 1908, may be given as an illustration of what is meant:

NUTRITION RETURNS OF ELDER CHILDREN (over 12).
Number inspected 8,003. Number reported upon 7,968.
Results per cent. reported upon.

Inspector.	Good.		Normal.		Below Normal.		Bad.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
A.	21	32	63	53	16	15	—	—
B.	2	5	94	91	4	4	—	—
C.	7	24	91	75	2	1	—	—
D.	4	12	94	87	2	1	—	—
E.	15	31	59	48	26	21	—	—
F.	17	13	82	83	1	4	—	—
G.	15	26	76	67	9	7	—	—
H.	28	38	53	47	19	15	1	1
I.	34	33	61	59	5	7	—	1
J.	32	42	58	50	10	8	—	—
K.	28	32	55	54	17	14	1	—
L.	6	8	93	90	1	2	—	—
Total	23	30	63	58	13	11	1	1

It is evident that the three inspectors who have returned only 2 per cent. of one sex and 1 per cent. of the other as below normal in nutrition require to readjust their standards, however favourable may be the conditions in the areas dealt with; and other points for criticism, some applying to all the observers alike, will readily suggest themselves.

This table also shows one of the sex fallacies already referred to which increase the value of such returns as an index of the care with which the observations are made. At the age dealt with the average height and weight of girls is greater than that of boys, and so, unless care is taken to make due allowance for this normal difference between the sexes, the number of girls returned as of good nutrition is likely to be much larger than that of boys, as is strikingly exemplified by some of the returns in the table. That the explanation for the difference given is the correct one is, I think, shown by the fact that amongst infants (who alone are at present available for comparison) the difference almost disappears.

The systematic preparation and employment of tables such as this appears to me to give more promise than any other single measure of securing the necessary co-ordination of the methods and standards of different workers, especially where circumstances render frequent personal contact impossible.

The labour of preparing tables in this form (for one's own use only) is less than it perhaps may seem, the percentages being very readily obtained from a book of tables, such as Cotsworth's.

In this connection I would plead for an increased use of percentages in all our statistical returns. If I read in one part of a table that 3,942 children were inspected, and in a different part of the table that 518 of these had bad boots, the idea conveyed to my mind is very much less precise than if I read that 13 per cent. had bad boots. In the one case a casual glance is informative; in the other the eye recoils from an indigestible mass of figures which, as a rule, the reader wisely declines the attempt to assimilate. Indeed, the translation into percentages may fairly be described as a peptonising process demanded by the nature of the pabulum.

A further advantage of this statistical means of control is that it tends to diminish the necessity for the personal presence of the organiser at inspections conducted by his fellow workers.

This inquisitorial investigation of the work of other men, whose professional skill may greatly exceed his own, must be embarrassing both to the organiser and to those whose work he has to direct. A certain amount of it is probably essential, but its diminution without loss of efficiency would be a relief to all concerned.

TABULATION OF INFECTIOUS DISEASE RETURNS.

In discussing tabulation systems, no allusion has been made to the methods of dealing with the returns made by teachers, often at the expense of considerable trouble, of the infectious disease histories of their children. There are at least two reasons why these returns should not be dealt with in the same way as the other particulars entered on the card. The first is that the facts for each child should always be kept written up to date; and the second that they should be available for all of the children using any one room in the school. If the records are kept on the general tabulation sheets at the office, many of them must be several years out of date and it is impossible to know the facts, even as recorded at their last inspection, for children occupying any one class-room. For if two children aged seven, and each in Standard I, are inspected together in 1909, they may be in quite different standards and rooms before 1912, when their ten-year old inspection falls due, and there is no means at the office of following their progress in school between inspections.

For these reasons the only satisfactory means of dealing with histories of infectious disease, so as to secure when required as much information as possible bearing upon the question of closure, is to have them tabulated by the teacher at the school. The best means of doing this will probably be found to be the provision of appropriate spaces in the school attendance register. The teacher is saved the trouble of copying out the children's names on to a special form, and the records are necessarily arranged by classes, and are always at hand when additional entries have to be made. An inch of horizontal space on the first page of the register suffices; it is divided into five columns for the five diseases on the Board of Education schedule. The minus sign indicates that the child is reported not to have had the disease, and the plus sign the contrary. A minus is easily converted into a plus at any time. If there is no information on the card the space is left blank. When a child is transferred to another class the information is transferred along with it, without the trouble

of referring to the card. The work involved for teachers, therefore, is very little. Provision can be made on the form on which the teacher reports cases of infectious disease for the simultaneous report of the proportion of children in the classes implicated who are plus, minus or blank to the disease reported.

It may be, however, that it is not wise at first to trust entirely to teachers in this matter. I have myself adopted an office system by which a number of children in the school of any given age reported at their last inspection to have had any of the five diseases will be readily obtained so that we shall not be entirely dependent upon the teachers. I regard it, however, as so inferior to the school system, except for the purpose of ascertaining the age incidence of these diseases, that I shall not trouble you with its details.

TEACHERS' LIST OF DEFECTS FOUND ON INSPECTION.

Another important object of the school medical officer's may be served by the register, namely, that of interesting the teachers in the results of inspection. If these results are kept buried in locked cabins, it is likely that many teachers will refer to them but seldom, and so may pay little attention to the records of children not obviously defective in a teacher's eyes. In order that their attention may constantly be called to all defects found, I advocate the allocation to this purpose of a column in the register alongside the infectious disease columns. Future issues of these registers in Somerset will have the five columns for infectious diseases, and a column $1\frac{1}{2}$ inches wide for entry of the nature of defects found.

It seems to me essential that teachers should keep, in one form or another, a list of "special" children, that is, of children found on inspection to require special care on account of their physical condition; and with this object I am now having a wrapper placed round the cards of such children when they are returned from the office to the school, so that this list may be made. Copies of these cards are kept at the office. Provision is made for re-inspection of children on the "special" list. I prefer this plan of distinguishing these cases to that of using a special card, as the special child of one inspection will often become the ordinary child of another.

It is necessary that in compiling their list of special children, teachers should distinguish in some way those with reference to whom

"directions to teachers" have been given, so that these directions may not be overlooked.

CO-OPERATION OF VOLUNTARY WORKERS WITH A VIEW TO SECURING TREATMENT.

Much, however, as teachers can do for delicate and defective children, both in school and by their influence with parents, there is plenty of room for other agencies in striving to turn the records of school inspection to the best advantage by securing the remedy, where possible, of defects then pointed out. I have already referred to two of these, the nurses and the school oculist. The consideration of the remedial portion of the functions of each of these should, strictly speaking, have come at this stage, but in each case it seemed more convenient to deal with their activities, as regards both inspection and remedial treatment, as a whole and in one place.

Teachers, nurses, and oculist have one feature in common, namely, that they are salaried officials of the Education Committee. There is plenty of room for voluntary helpers as well, and it would be a thousand pities not to make an effort to enlist their services.

The most obvious method of doing this would be to invite the co-operation of school managers, who might be got to interest themselves in the defects of children attending their school, and endeavour to persuade parents to get them attended to. This is certainly a simple plan, for managers could be invited to consult the cards or other records kept at the school, and need not, therefore, be specially informed of cases requiring attention. This system has, I believe, been instituted in some areas, with what degree of success I cannot say. Probably it is too early as yet to judge of any method adopted for this purpose.

One objection to this plan of referring cases to the managers, which has appeared to me to be of importance in Somerset, is that it might be regarded by some parents as making the facts revealed by inspection too public. If in a small village these facts are communicated to six of the principal inhabitants it is difficult to see how "the confidential nature of many of the entries" can be carefully respected as enjoined by the Board of Education Circular 576. I fear that under this system parents, knowing that any defects found would be communicated to a number of their neighbours, with whom they might not be on the best of terms, would sometimes be reluctant to submit their children for inspection.

On the other hand, some notices of inspection

issued to parents state that the results will be treated as strictly confidential between doctor and patient. If this is fully carried out it is difficult to see how the inspections are to be followed up.

The system being tried in Somerset occupies an intermediate position. It has been suggested and worked out by the Chairman of the County Council and of its Education Committee, the Right Hon. Henry Hobhouse, and has met with approval at Whitehall. The district education sub-committee throughout the county, of which there are thirty, have been invited to undertake the work, appointing where necessary additional members, and especially lady members, for the purpose. It has been suggested to them that reports received should be referred for investigation to individual members (or associates for this purpose only who may be school managers) living near the children's homes. Under this system only one person need be informed of the case, and that a person selected for known discretion as well as for interest in the children's welfare. It will probably be found, however, that only a minority of references require to be treated as confidential.

It is hoped that the committees will be of much service in at least three ways:—(1) They can ascertain the circumstances of parents, and their ability and willingness, or otherwise, to do what is required out of their own resources. In this they will have the assistance of the teacher and attendance officer. (2) Where these resources are adequate they may persuade parents themselves to obtain necessary treatment, in some cases warning them of the consequences of neglect. In this they will frequently have the assistance of the district nurse. (3) Where, in their opinion, the means of the parents are insufficient to enable them to provide the whole or part of the cost of the necessary treatment, they may have recourse (a) to any local charities, of which a certain number either are applicable or might under a new scheme be made applicable to the relief of school children; (b) to the liberality of private individuals in the locality; (c) to the County Committee for such assistance as it is empowered to grant; (d) to the Poor Law Guardians.

The scheme has been well received by the committees, and is now in operation in many parts of the county.

Cases are reported upon sheets which are very similar to the special case cards in use

in some areas. One side of the sheet is devoted to the inspector's notes (in popular language) of conditions observed and treatment recommended, and the other to notes by the person in charge of the case locally. Arrangements are being made for these forms to circulate between local committee, school and office. They will be sent to the school in readiness for the visit of the inspector, who will then make any additional notes required, and return them, with the inspection cards, to the office, whence they will be returned to the local committee.

DISCUSSION.

DR. SIDNEY BARWISE (Derbyshire) thought they were all in agreement with Dr. Stevenson as to the desirability of figures being converted into percentages to have any meaning. He considered it very important that the reports published should have the same headings. In his opinion it was a great pity that a schedule of an annual report had not been published by the Board of Education.

SIR SHIRLEY MURPHY commented upon the advantages of utilising the services of school teachers, as demonstrated by Dr. Stevenson.

DR. FRAS. E. FREMANTLE (Hertfordshire) said that in his county they had been able to get a great deal of work done by the teachers, but he would be chary of allowing the teacher to do as much as Dr. Stevenson permitted them to do in Somerset. He (Dr. Fremantle) advocated the use of numerical symbols in the preparation of reports, and explained fully the method employed by him. In regard to the employment of village nurses, he pointed out that there were a large number of villages having no nurses at all. He considered that the development for the future would be in the direction of village nurse-midwives, and he thought the Society should press to secure that end.

DR. W. H. SYMONS (Bath) thought that if they were to have an interchange of cards they should come to some understanding in regard to the use of abbreviations, and whether letter or figures should be employed.

DR. BUTCHER (Bedfordshire) said that in his county they were very fortunate in obtaining assistance from the teachers. The reports on clothing and cleanliness were not very reliable, as they found that the children came in their best clothes for the inspection. They noted the fact of parents being present or not, and found that 75 per cent. of the mothers attended the inspection.

DR. JAMES KERR (London County Council) congratulated Dr. Stevenson on his excellent paper. He had gone carefully into the whole system and shown them what the developments would be in rural districts. He (Dr. Kerr) believed that dull

and defective children were in excess in village schools but were not noticed. He considered that the whole business of medical inspection ought to be to get hold of the defective child and procure treatment for it. It seemed that the State service falls short, inasmuch as it gives inspection without the corollary of treatment. It was very questionable whether it was worth while merely collecting statistics. In regard to the assistance of teachers, some of them took a very great interest in the matter, but throughout the whole teaching service of the country there was a distinct feeling that medical inspection was something that was going to be imposed on them with extra duties.

DR. WM. BUTLER (Willesden) considered it a little unfortunate that there should be any doubt cast upon the value of medical inspection from the statistical standpoint. While the main object was remedy, it was premature until they had the data.

DR. J. T. C. NASH (Norfolk) stated that after circularizing the teachers in his county he had received very great assistance from them. He agreed with Dr. Fremantle as to the development of nurse-midwives.

DR. E. SERGEANT (President) considered that the paper was an invaluable one from the point of view of uniformity. At the same time he was rather surprised that so little had been said in regard to the sanitation of schools. It had distinct reference to medical inspection of school children, and he thought that it would be an advantage to have a paper on the subject. In his county (Lancashire) the schools were very insanitary and were constantly being closed.

DR. STEVENSON, in reply, said that he found himself largely in sympathy both with Dr. Kerr and Dr. Butler on the subject of statistics, though their views seemed to be totally opposed. There was no doubt that many of the returns received were intrinsically not worth collecting. But there were two powerful reasons for collecting even faulty statistics: (1) that to impress local committees one had to adduce local facts, and (2) that the best way to secure more reliable returns at a later date would be by making the best possible use of those now available. When the causes of death were first registered it would have been poor policy to refrain from tabulating them because many of the returns were faulty. It was necessary to bear the gross imperfections of many of the returns in mind, especially when trying to draw deductions from them, but this seemed rather an argument for endeavouring to improve the records than for suppressing them. It seemed a pity to carry out all the labour of collection in compliance with the Board's schedule and then deliberately to refrain from presenting the results of the enquiries made, for the work of collection was vastly greater than that of tabulation.

He had been much impressed by the inequality

of distribution of mental deficiency in village schools, but had not noticed the degree of difference in vision to which Dr. Kerr had referred.

The necessity for uniformity of symbols would probably soon be found an urgent matter, and it was to be hoped that steps would before long be taken to secure it.

The use of numerical symbols, as described by Drs. Fremantle and Kerr, was most interesting and ingenious, but it would not give him all the information he desired. It was adequate for the comparison of results from different localities where the reports were of equal value, but not for comparing the value of the reports themselves. For example, two inspectors in similar districts might get the same result for, say, nutrition. Each might return an average result of three for his inspections, and yet the one man's work be good and the other's useless. For if an inspector wrote down three, or average, against nearly every child he saw, without troubling to form a critical judgment, he would probably get a very similar average result to that of the man who carefully assessed each child's condition, and whose returns were therefore well distributed amongst the various possible marks, as the latter's high marks would very likely about neutralise his low ones. To test this vital point of distribution, then, it was necessary to tabulate the returns under each heading, and in order to do this conveniently it was well to restrict the number of headings. He considered those suggested in the schedule sufficient.

There appeared to have been some misunderstanding of the method of recording cleanliness and clothing. The returns were made neither by teacher nor by inspector alone, but by both in co-operation, the final responsibility resting upon the inspector, who had the teacher's estimate before him when forming his own.

THE NEED FOR SCHOOL CLINICS FOR DEFECTIVE EYESIGHT.—The provision of treatment generally, at the public expense, is not to be recommended, even where the cost can be recovered from the parents, but obviously there are some cases that call for urgent consideration, and these children of the very poor, with imperfect sight, most of all. Here are 252 children with bad vision or squint who not only must suffer acutely in their efforts to do the work in the schools, but from their infirmity are unable, do what they will, to give the attention necessary to receive knowledge and fit themselves for earning their share of the school grant. Many, probably all, of the parents are anxious to obtain treatment, but notes for the Eye Infirmary are almost unobtainable, and the special fee, otherwise necessary, is beyond their means. It must not be overlooked that, as hinted above, apart

from the relief to the child, immediate treatment of these cases would secure direct financial gain to the committee. The children would be able to make more regular attendances, to learn better when at school, and the grants thereby increased. Some time ago I found a child with squint playing in a dirty house, who, four months before, had been examined in the school and notice sent to the parents. The mother, grateful for the advice given, and anxious to do her best, procured a note for the Eye Infirmary, and the child was treated there. A second note was required before spectacles could be supplied and this she could not obtain, with the result that for four months the child was absent from school and there was no intention of letting him return. During this period the child was running about a dirty house and yard; he lost four months of training and all that implies, and the committee lost the grant. With the consent of the Board of Education the committee has power to make certain arrangements for treatment in such cases. They can, for instance, subscribe to local hospitals or infirmaries for this purpose, but there many objections to this. Under no circumstances will the Board sanction the supply of spectacles for needy children unless they have been prescribed, after examination, by an ophthalmic surgeon, that is, one specially versed in refraction. After very careful thought I earnestly recommend the committee to make such an appointment. An arrangement could be made by which the surgeon could attend at some place—possibly the town hall—for an hour, at stated periods, to examine the eyes of such cases as were referred to him, and to prescribe suitable glasses, with cheap but effective frames. These could be purchased by the committee, probably at wholesale prices, and the cost could be recovered from any parents able to pay. The relief of suffering to the little ones is our first and most urgent duty, and the outlay, further, would be recouped in the increased grants.—*Annual Report on the Medical Inspection of School Children, by Dr. Ridley Bailey, Medical Officer of Health, Bilston.*

THE STATE AS FOSTER-MOTHER.—With the continuance of so high a rate of infantile mortality, no other way to prevent it seems possible than for the State to assume the burden and responsibility of foster-mother, and to have attached to every Board school a nursery, controlled by a trained nurse, in which girls in their last six months at school shall be trained in house work and to wash, dress, and feed infants and young children. Some such method will inevitably be introduced—at no very distant period—if the present-day tragedies of infantile slaughter continue.—*Annual Report of Dr. McLean, Medical Officer of Health, Doncaster.*

CONSIDERATION OF CERTAIN FACTORS WHICH OPERATE IN THE CAUSATION AND SPREAD OF SCARLET FEVER.*

By JAS. T. NEECH, M.D., D.P.H.,
Medical Officer of Health, Halifax.

I THINK it is now generally admitted on all hands that whatever benefits the community may have derived from isolation hospitals, the establishment of these institutions has not had the effect of controlling and arresting the spread of scarlet fever in the way it was originally anticipated. I am not going to quote a large number of statistics to show this, as that has been repeatedly done in recent years. I would like, however, to refer to the figures of one county which I think are of more value in this direction, in consequence of its isolated position. I refer to the County of Cornwall, and I am indebted to the Chairman of the Sanitary Committee, the Right Hon. J. R. de C. Boscawen, for the figures relative thereto.

The County of Cornwall has a population of 322,705, and the rural portions of the county contain an aggregate population of 50,000 more than the urban districts situated therein. The county contains 16 rural and 27 urban districts, of which three of the former and eight of the latter are provided with isolation hospitals.

The following table, No. 1, gives the population, the number of cases of scarlet fever reported, and the average attack rate per 1,000 of the population per annum during the ten years 1898 to 1907 inclusive, distinguishing between those districts provided with and those without hospitals:—

	Population.	Number of cases of scarlet fever.	Attack rate per 1,000 per annum.
Urban { No Isolation Hospital	62,952	1,270	2.01
{ Hospital provided ...	73,377	1,756	2.39
Rural { No Isolation Hospital	135,538	3,165	2.33
{ Hospital provided ...	50,838	1,175	2.31
Whole { No Isolation Hospital	198,490	4,435	2.23
County { Hospital provided ...	124,215	2,931	2.35

It will be observed that in the urban areas the average attack rate was .38 per 1,000 in favour of those districts without hospital accommodation, whereas in the rural the attack rates are about the same. Taking the county as a whole there is very little difference, but what there is, is in favour of those districts which have no hospital accommodation.

* Presidential Address delivered to the Yorkshire Branch of the Society of Medical Officers of Health on December 9th, 1908.

The village of Northowram is situated on a hill, and is separated from the Borough of Halifax by the Shibden Valley. There is a considerable population in this valley, but they are separated from the village above by open country. There is a school in the valley for the children living there, and also one in the village, so that there is no mixing at school between the village children and those living in the valley below. A few scattered cases of scarlet fever occurred in the Shibden Valley during 1904, and a further outbreak also began in the second quarter of 1905. No case had so far been reported in the village, and no known case had occurred there for over two years, but a case was notified at the end of April, 1905. Isolated cases kept cropping up, and by the end of September eight had been reported. During October, twelve; during November, twelve; and during December, six cases respectively were notified. A few cases occurred during the early months of 1906, after which the epidemic subsided. The patients were all of school age or below, and 75 per cent. were removed to hospital. There were only one or two return cases in the ordinary acceptance of the term. The school in the village was not closed except for the ordinary Christmas holidays, and before that about half of those attacked with the disease had returned to school.

The following table, No. 2, shows the number of cases which returned to school and the number notified during the last four months of the year:—

Month.	Number that returned to school.	Number of cases notified.
September ...	5	3
October ...	8	12
November ...	3	12
December ...	7	6

It will be observed that the return to school of thirteen children during September and October was followed by the occurrence of twelve fresh cases during each of the months of October and November, and six during December. Although half of the children affected did not return to school till after January 1st, 1906, only twelve cases were reported during the first five months of the year which ended the epidemic.

It seems to me that the large majority of the susceptible children in this school had probably already been attacked with the disease, which together perhaps with the influence of the Christmas holidays account for this.

It will be observed that in this particular

outbreak 75 per cent. of the cases were removed to hospital, and, what is important in this connection, the first cases reported were so isolated; also, every case which could not be properly isolated at home was taken to hospital.

It appears to me that this is an instance in which hospital isolation ought to have been especially successful, as factors were present calculated to favour that end, and yet the disease continued to spread.

Undoubtedly, unrecognised cases play an important part in spreading this and other infectious diseases, and when such cases occur in connection with a milk supply this is especially the case. I shall deal more fully with the question of unrecognised cases presently, but in estimating the value of isolation hospitals in dealing with scarlet fever these factors must be taken into consideration, and whatever may be the extent of their failure in this direction, hospital isolation cannot be blamed, nor its efficiency called in question, when it fails to arrest the spread of a disease which is propagated under those conditions.

Let me for a moment discuss the influence which an infected milk supply bears to the causation and prevalence of this disease, and I will take the case of my own town to illustrate the point I wish to enforce.

In Halifax the notification of infectious diseases was made compulsory in 1883. In this connection, however, I want to go back to the year 1881, and I have been able to form a rough estimate of the approximate number of cases of scarlet fever which occurred in the borough during 1881 and 1882, so that the following table, No. 3, gives a fairly accurate statement of the number of cases each year since 1881:—

Year.	Number of cases.	Percentage removed to hospital.	Case mortality, per cent.
Estimated 1881 ...	750	5.6	11.2
" 1882 ...	250		
Notified 1883 ...	158		
" 1884 ...	269	8.5	6.3
" 1885 ...	214		
" 1886 ...	124		
" 1887 ...	727		
" 1888 ...	440		
" 1889 ...	153	11.4	6.3
" 1890 ...	328		
" 1891 ...	429		
" 1892 ...	256		
" 1893 ...	150	26.3	3.6
" 1894 ...	114		
" 1895 ...	52		
" 1896 ...	44		

Year.	Number of cases.	Percentage removed to hospital.	Case mortality, per cent.
Notified 1897 ...	476	61.2	3.4
" 1898 ...	626		
" 1899 ...	762		
" 1900 ...	330		
" 1901 ...	736	77.2	3.1
" 1902 ...	452		
" 1903 ...	320		
" 1904 ...	486		
" 1905 ...	338	62.0	2.9
" 1906 ...	214		
" 1907 ...	89		

Attack rate.
1st period Average 278 cases ... 3.1 per 1,000
2nd period " 439 " ... 4.1 per 1,000

Judging from the number of deaths recorded in this disease had been more or less prevalent in Halifax during the years immediately preceding 1881, but in the latter year a fresh strain of infective material was introduced into the borough from the outside, by an infected milk supply, which, judging from the case mortality of 11.2 per cent., was of a rather virulent type. This occurrence resulted in a serious recrudescence of the disease, and although the number of cases notified varied more or less from year to year, its influence was, in my opinion, felt through the succeeding fourteen years.

On referring to Table 3 you will observe that the number of notifications fell to a very low level during 1895 and 1896, so much so that a large town having only that number of cases would be considered practically free from the disease. The virulence of that particular strain of infective material had evidently become almost exhausted, when during the next year, 1897, the incident of 1881 was repeated. In this case also the infected milk was produced outside the borough, and the supply involved was a rather large one. As a result the number of notifications suddenly jumped up from 44 to 476 per annum, and the disease continued to be very prevalent during the next ten years, for it was not until last year, 1907, that the number of notifications fell to anything like what obtained during 1895 and 1896. I cannot help but think that the influence of the fresh infective material introduced by the milk in 1897 was felt during the succeeding ten years, and that the greater prevalence of the disease during those years was at any rate partly due to that fact.

Referring again to Table 3, and dividing the years 1881 to 1907 into two periods, beginning with the milk epidemics of 1881, and 1897 respectively, it will be observed that during the first period very little hospital isolation was resorted to, whereas during the second period

on an average nearly 70 per cent. of the cases were removed and treated therein. During the first period 4,458 cases occurred, which was equal to an annual attack rate of 3.1 per 1,000 and during the second, or shorter period there were 4,829 cases, equal to an attack rate of 4.1 per thousand of the population. It appears evident, therefore, that the very much increased hospital isolation during the latter period did not serve to diminish the attack rate of the disease within the borough; but to this I shall refer again a little later.

In attempting to obtain information with a view to show the value or otherwise of hospital isolation, I believe it has been frequently customary to get out all the requisite particulars, such as the occurrence of secondary cases, etc., in connection with those patients who are treated at home in a given year, and compare the same with those which are removed to hospital for isolation. This is, on the face of it, not a fair comparison, because in the case of those patients treated at home there would be greater facilities for isolation than would obtain in the large majority of instances where hospital isolation is resorted to.

The most reliable information in this direction would be obtained by comparing a number of years in which there was practically no isolation in hospital with a number of years in which such isolation was largely resorted to.

I regret that the time at my disposal in preparing this address did not enable me to do this, but I have done the best I could, and have compared two years, 1887 and 1888, during which only 8 per cent. of the cases were treated in hospital, with the two years 1901 and 1902, during which 80 per cent. were so isolated.

On referring to Table 3 you will observe that these two periods compare pretty nearly as regards the number of cases notified.

The following table, No. 4, gives the particulars regarding these two respective periods, and serves to compare them with each other:—

Years.	Number of cases notified.	Number of secondary cases.	Percentage of secondary cases.	Number of houses in which occurred		Percentage in which secondary cases occurred.	Percentage of cases isolated in hospital.
				Primary cases.	Secondary cases.		
1887	727	145	20	513	92	17.8	8
1888	440	87	20	314	65	20	
1901	736	113	15	569	68	12	80
1902	452	85	18	340	52	15	

On referring to the above table it will be observed that during 1887 and 1888, when only 8 per cent. of the patients were isolated in hospital, there were 20 per cent. of secondary cases, against 15 per cent. and 18 per cent. respectively during 1901 and 1902, when 80 per cent. were so isolated, and that during the former years the percentage of houses in which secondary cases occurred was 17.8 and 20, against 12 and 15 respectively during the latter years.

Of course, the shortness of the above periods detract from the value of any results arrived at by comparison, but if they be typical of other years, these figures show that though there are factors in operation which tend to cause this disease to spread to a larger number of individual households, yet hospital isolation tends to reduce the number of secondary cases.

That hospital isolation does affect the spread of this disease will be seen by the table which follows, in which I have shown the number of secondary cases which occurred each week up to the thirteenth week after the primary cases were reported.

The following table, No. 5, shows the period in weeks which elapsed between the occurrence of the primary and secondary cases during the undermentioned years:—

Week ...	1	2	3	4	5	6	7	8	9	10	11	12	13	14 and upwards
Year 1887	45	32	13	10	4	2	2	1	0	0	0	0	1	0
" 1888	30	28	11	6	0	3	0	0	1	0	0	0	0	1
Totals...	75	60	24	16	4	5	2	1	1	0	0	0	1	1
	184 97%													6 3%
Year 1901	37	15	9	5	0	1	3	0	5	6	10	5	2	5
" 1902	27	7	5	2	2	0	4	2	4	3	5	6	2	4
Totals...	64	22	14	7	2	1	7	2	9	9	15	11	4	9
	110 62.6%													66 37.4%

From the above table it will be observed that during the non-isolation years 97 per cent. of the secondary cases occurred within six weeks of the primary ones, and only 3 per cent. afterwards, whereas during the isolation years 62 per cent. only occurred within the same period and 37 per cent. afterwards.

These figures, together with those in the previous table, though they do not prove, tend, I think, to indicate that the aggregation of cases of scarlet fever in a hospital is rather more favourable to the production of so-called carrier cases than patients treated at home. At any rate, they show that a proportion of the

cases when dismissed from hospital are not free from infection, and that they apparently cause secondary cases many weeks after such cases have ceased to arise from home-treated patients.

The opinion has been frequently expressed that a larger proportion of the cases of scarlet fever treated in hospital develop sequelæ and complications, in comparison to cases treated at home, more especially discharges from the nose and ears.

I must say that I have inclined also to that view, but I cannot bring figures sufficient to either corroborate or otherwise the correctness thereof.

I have, however, got out particulars of 283 cases which occurred during the year 1905, 214 of which were removed to hospital, and 69 were treated at home. On comparison these cases tend to show that there is very little difference in this respect. For the particulars regarding the home-treated cases, I am indebted to the medical men who attended them.

Of the 214 hospital cases, 58 developed complications of various kinds, or 27 per cent., and of the 69 home-treated cases, 18 were similarly affected, or 26 per cent., a difference of 1 per cent. only in favour of the latter.

With regard to the nature of the complications, there were 37 cases of aural and nasal discharges in connection with the hospital treated cases, against 11 cases among those treated at home, or a number which nearly exactly corresponds to the above 1 per cent. in favour of the home-treated cases.

These figures, of course, prove nothing, and I only give them for what they are worth.

Since the institution of hospital isolation of scarlet fever, the question of return cases has sorely exercised the minds of medical officers of health in their efforts to cope with epidemics of this disease. Hospital management, the overcrowding of wards, and other conditions have been blamed for the occurrence of these cases.

These conditions may tend to increase the number of such cases, but I doubt very much if they have any marked effect in that direction, and so long as we have isolation hospitals, I am of opinion that we shall have a certain percentage of these cases.

As to whether the establishment of hospitals on the cubicle system would be attended with greater success I cannot say, but even then I believe we should not be entirely free from the occurrence of return cases.

To minimise this danger it has been recommended, among other things, that patients should be treated in a convalescent ward for a fortnight before discharge from hospital.

During 1901 my committee sanctioned the use of a large house standing in its own grounds for this purpose, which was situated a considerable distance from the hospital. All the cases sent there were detained in hospital for six weeks, and for two weeks in this convalescent home. Moreover, only those patients which during the course of the disease had remained free from complications were sent thither, and yet the percentage of return cases resulting from these cases was practically the same as that resulting from those patients discharged directly from the hospital.

The fact that a certain small percentage of return cases occur is not sufficient justification for the wholesale condemnation of hospital isolation. This question must be looked at and considered from every standpoint, and, while we may have tended towards one extreme, there is no earthly reason why we should rush headlong to the other.

A few return cases *per se* is of no very great moment, but I must say that, in view of recent discoveries in the way of so-called carrier cases, the fact that a patient who has suffered from typhoid fever, and is consequently himself immune against an attack of the disease, can carry about within him the active virus of that disease for years; the fact that apparently healthy people harbour within their mouths the bacillus of diphtheria, both tend, in my opinion, to make the occurrence of return cases more serious. If a patient after recovery can harbour the germs of typhoid fever and diphtheria it is only reasonable to suppose that the same thing can occur in the case of scarlet fever also. If a patient discharged from hospital can infect another member living in the same house, there is no reason why this should not occur also in the case of a susceptible member of another household with whom he is brought into intimate contact. The epidemic of scarlet fever in connection with Northowram School, referred to in the early part of this address, tends to support this view.

It is on this account that I do not place any great value on figures which represent the percentage of return cases only in the ordinary acceptance of the term.

It must not be understood that I am intending to convey the idea that hospital patients, which are the cause of return cases,

are the only carriers in the spread of this disease, because that is not so, for I have no doubt that cases treated at home act in the same way, as well as the unrecognised who have suffered from the disease.

Table 3 brings out a fact which is very well known, viz., that there has been a gradual and marked fall in the death rate from scarlet fever.

On studying these figures, a point of considerable interest presented itself, as I was not aware of the fact previously, and I do not know if the same thing obtains generally, because I have never seen it referred to: I found that while the death rate from this disease had fallen so considerably, the age at death had increased. It is well known, of course, that such has been the case in connection with some other diseases, but I was not aware that it was so in scarlet fever.

Previously to 1887 the deaths occurring in Halifax had not been regularly separated and arranged into age periods, consequently I have only the figures for the past 21 years to refer to.

Taking the years 1887 to 1896, the total number of deaths in each of the under-mentioned age periods was as follows:—

Age Periods	0-1	1-5	5-15	15-25	25-
Deaths ...	10	79	46	6	0

and taking the years 1897 to 1907 the figures were:

Age Periods	0-1	1-5	5-15	15-25	25-
Deaths ...	7	72	60	17	6

It will be observed that no deaths during the former period occurred above 25, against 6 during the latter period.

If these figures be expressed in percentages of the total deaths during the two respective periods of years, they compare as follows:—

1887-96	0-1	1-5	5-15	15-25	25-
	6.1	56.4	32.9	4.3	0 %
1897-09	4.3	44.5	37.0	10.5	3.7 %
Difference	-1.8	-11.9	+4.1	+6.2	+3.7 %

I regret that the Register of Notifications during the earlier years does not contain the age of the cases notified, consequently I am unable to compare the attack rate and case mortality of the two periods at the above age periods.

If the above figures be representative of what has happened in the country generally, and I shall be very interested to learn whether that is so or not, then it appears somewhat strange that a disease which has so markedly diminished in its virulence should be accompanied by a higher age fatality.

The question of the diminution in the virulence of this disease is highly interesting. The cause of this has been frequently discussed,

but I must say that I have not yet seen any theory advanced which, to my mind, is sufficient and adequate to explain the same.

The isolation hospital has been credited with bringing about this result. That the hospital has served to diminish the death rate from scarlet fever I will not deny, because the skilled nursing, better attention and treatment which patients receive therein must have tended in that direction; and had the lowering of the death rate not been accompanied by an increasingly milder form of the disease, we might have ascribed the present comparatively low mortality wholly to hospital influence. I notice Dr. Niven gives it as his opinion that if hospital isolation were dispensed with the virulence of the disease would increase. Why should this be the case? I cannot by any process of reasoning see why such a result should follow. This does not occur in those districts where hospital isolation is not resorted to. If a new strain of infective material of a more virulent type were introduced into the country and spread therein, the disease would possibly assume a more serious aspect. To my mind there can only be two causes for the increasingly mild nature of this disease:—

- A general diminution in the virulence of the infecting material.
- A greater general immunity on the part of the public against the disease.

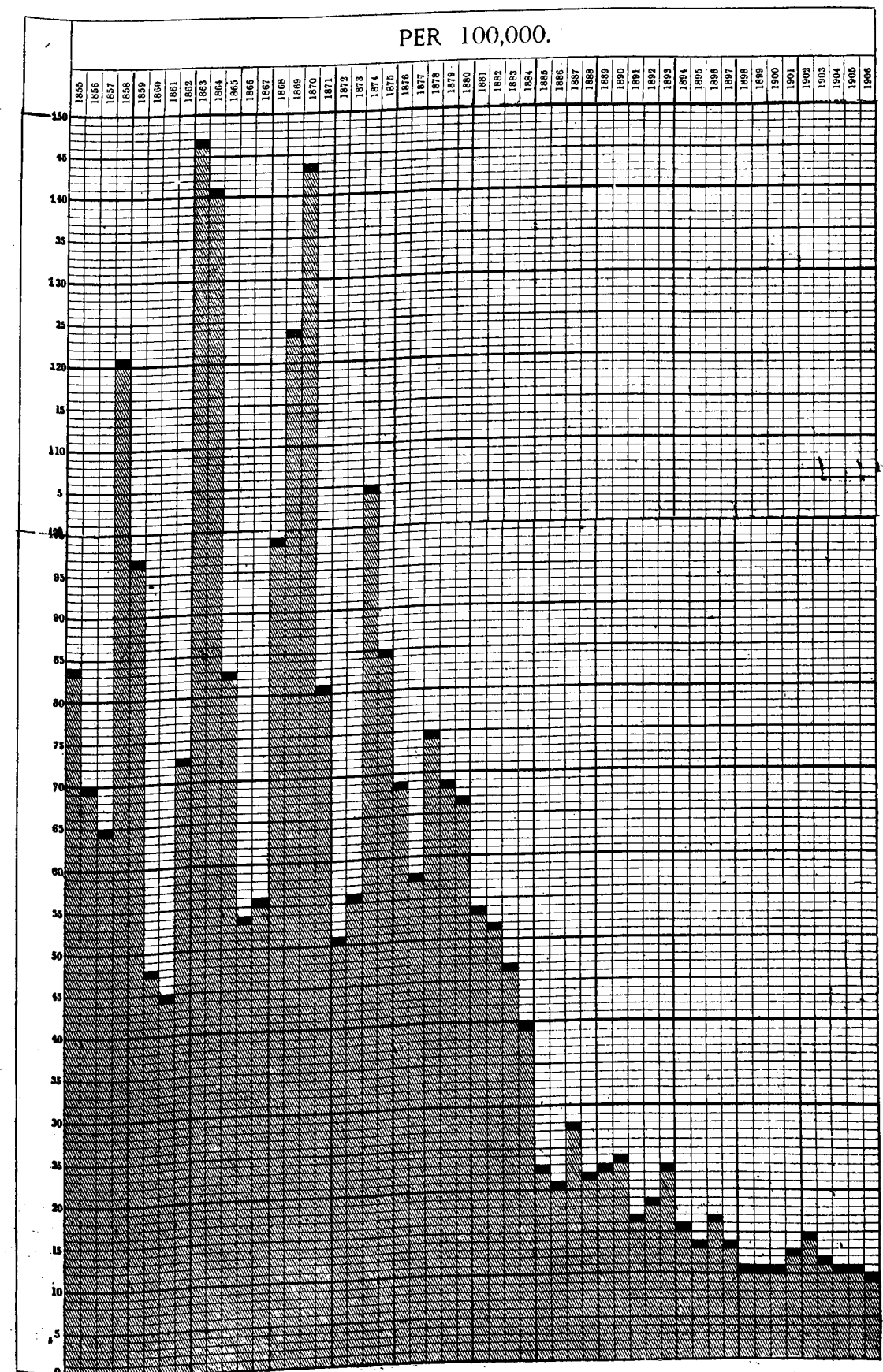
These two factors act and react upon each other. A lessened virulence produces a milder attack, and this in turn, while conferring more or less immunity upon the individual, tends to reduce the virulence of the infecting agent.

But the question is, How has this condition of things been brought about? I am going to venture a theory in answer to this question.

It is a well-known fact that the elementary day school is an important factor in the spread of this and other diseases. In the school, children are brought together from wide areas. Consequently, children have been and are brought into intimate contact with each other, which, apart from the school, would never occur. In this way children that were highly susceptible have been mixed up with those who were less susceptible, and with those who were immune against an attack of the disease. When the virus of this disease gained access to a school it would naturally attack the more susceptible among the scholars, who, in consequence, on recovery would be rendered more or less immune against the disease.

Immunity is either natural or acquired, and

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50
100 to 50, 1888
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evidence goes to show that even acquired immunity tends in successive generations to become more or less natural. For example, the native races in many parts of the world are comparatively insusceptible to yellow and typhoid fevers and malaria. Take also the case of the Faroe Islands in 1846 and the Fiji Islands in 1875, when measles was first imported. The inhabitants of these islands had not during preceding generations been subjected to the immunising effects of repeated epidemics of this disease. They were consequently highly susceptible, and the disease made great havoc in their midst.

I therefore venture to state that, in my opinion, the Compulsory Education Act of 1870 has played an important part in the cause or causes which have brought about this diminution in the virulence of scarlet fever in comparison with what obtained 50 years ago.

Previous to 1870 only a portion of the children of the country attended school and were brought into contact with each other. Among the remainder would be a large number who, though highly susceptible, would never be in the way of catching the infection, and would therefore never be rendered immune on account of previous attacks of the disease. A large proportion of whole families would probably, generation after generation, be in this position, and yet the disease would not spread so generally as it does now, because the facilities for doing so were not present. Of course we have no means of definitely ascertaining, but I have no doubt that had the Notification Act been in force in those days we would have found the attack rate considerably less, though the mortality was much greater than it is to-day.

With the advent of the Education Act of 1870, all children were compelled to attend school, and since then the greater proportion of the population of the country have passed through the elementary schools. It is therefore not very likely that there are now many or any families which have remained, generation after generation, without being brought into contact with this disease through the medium of the day schools, and the mass of the people have in that way acquired a greater general immunity from scarlet fever than existed 50 years ago.

In support of my argument I would refer you to Chart 1, which shows the death rate from scarlet fever for England and Wales since 1855. Previous to 1855 I find diphtheria deaths were not separated from scarlet fever.

Look at the irregularity of the death rate from 1855 to 1870; years of comparatively low death rates alternating with years of successively high ones. Since 1870 there have been only two marked rises, viz., in 1874 and 1878, and these were small compared with previous epidemic years. There was a marked drop in the death rate in 1885, and it has not since risen to near the point from which it fell. In connection with this I would point out that an increasingly large number of children attending the schools from this year onwards would be the offspring of those who attended the schools from 1870 onwards.

The figures for the administrative County of London point to the same conclusion, as the following table, No. 7, shows:—

Period.	Death rate per 1,000 in the Administrative County of London from scarlet fever.
1861—70	1.13
1871—80	.60
1881—90	.33
1891—1900	.19
1901—06	.10

But scarlet fever is not the only infectious disease the death rate of which has fallen since 1870. The same thing has occurred in connection with whooping cough, though not to such a marked degree. See Chart No. 2, which shows the fall of the death rate from whooping cough for England and Wales, and Table No. 8, which gives the figures for the administrative County of London.

Period.	Death rate per 1,000 from whooping cough in the Administrative County of London.
1841—50	.87
1851—60	.88
1861—70	.88
1871—80	.81
1881—90	.69
1891—1900	.50
1900—06	.33

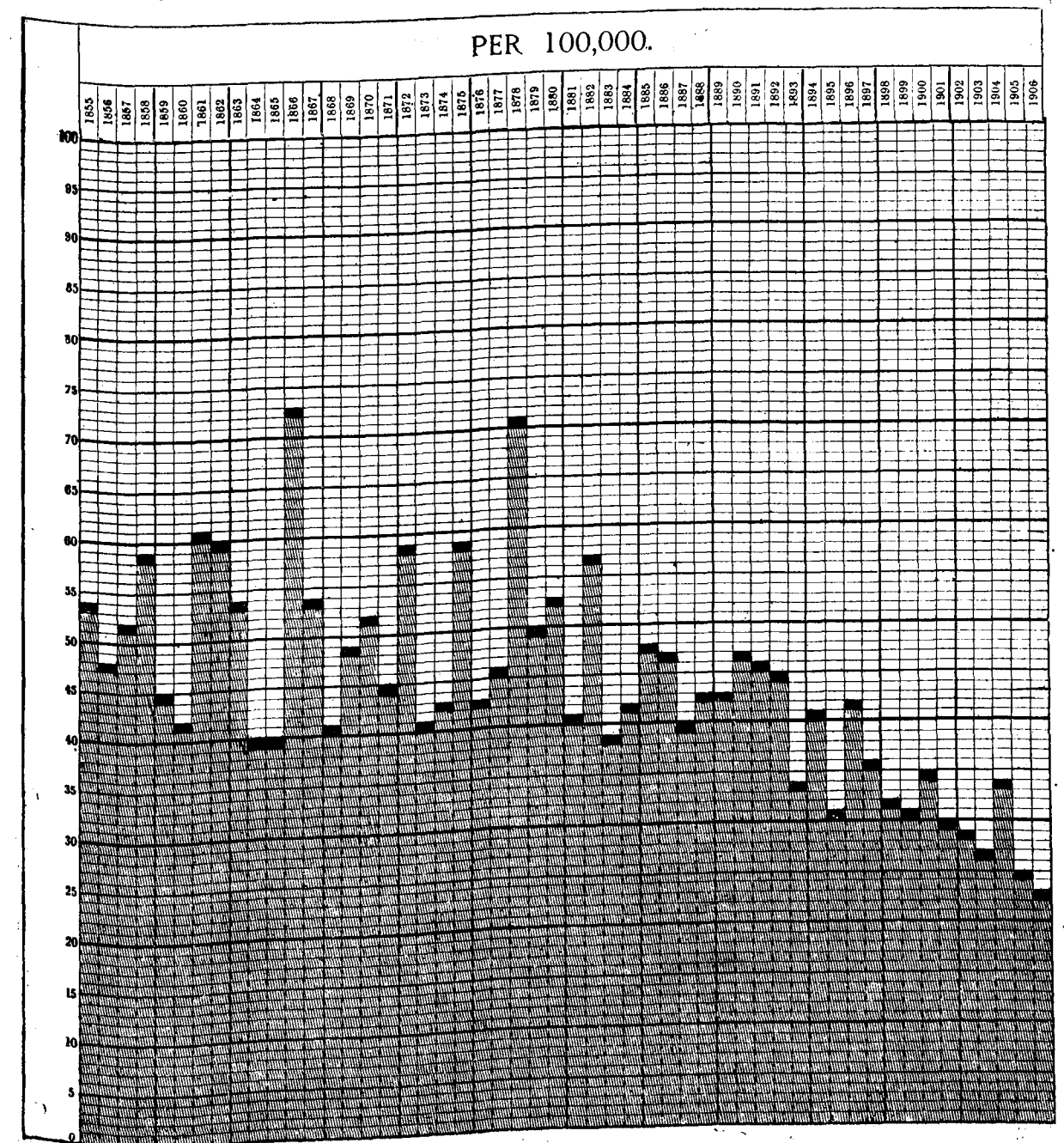
On referring to the charts it will be observed that the fall in the death rate from scarlet fever commenced with the year 1885, whereas in the case of whooping cough it did not begin until 1893, or eight years later.

Whooping cough is a disease from which one attack appears to confer almost complete immunity, but even in measles, in which this is not nearly so marked, statistics seem to show that a fall is also taking place in the death rate therefrom.

While the fall which has taken place in the death rate from these infectious diseases, and more especially scarlet fever, is so far satisfactory, yet the routine methods which have been adopted, viz., notification, hospital isolation, and disinfection, in dealing with outbreaks of the latter disease, which were

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looked forward to with such hope, have been very disappointing in their results.

In the case of epidemics of small-pox these methods are successful. It is true that in the latter disease we have the valuable aid of vaccination to assist us, but from my experience I believe that, even apart from vaccination, an outbreak of small-pox could be much more successfully dealt with and controlled, by

notification, isolation, and disinfection, than an epidemic of Scarlet Fever. Why is this the case? One important reason is that the specific organism involved in the causation of small-pox is alien to this country. It has to be imported and spread among the public before an epidemic can occur. Whereas the virus of scarlet fever is always present amongst us; the disease is endemic in our midst.

A case of small-pox, isolated until every scab is removed, can, after efficient and thorough disinfection, be discharged with confidence as to his freedom from infection, and with safety to the public. This cannot be done with scarlet fever, hence one important reason why hospital isolation is so efficient in the former case compared with the latter.

The virus of small-pox, however wide-spread it may become, is more or less limited in its ramifications among the public, and in a comparatively short period it discloses its presence in any particular locality. There is no evidence to my knowledge that a person not suffering from the disease can act as a carrier thereof in the present acceptance of that term, consequently it is possible in time, so to speak, to circumvent and destroy the infecting material and eradicate the disease from the country.

In the case of scarlet fever this is impossible, at any rate with our present knowledge, and by the aid of existing methods. The specific virus of the disease is so wide-spread among the public. It appears as though it can remain dormant for long periods, and even when it becomes active in any particular locality, what with the evident power of patients to harbour active infective material after recovery, and the great probability that even others immune thereto can do the same thing, and act as carriers of the disease, we can form no idea of the extent of its ramifications, nor place limitations upon its spread. We do not know exactly where the virus is, and therefore we cannot lay hold of it and destroy it.

All our present preventive measures are directed towards the destruction of the specific poison. We have no means at our disposal for rendering the soil immune, such as we possess in the case of small-pox. And a receptive and susceptible soil is as essential as the presence of the seed to the development of this and other diseases. Generally speaking, too great attention is paid to the seed and too little to the condition of the soil.

I know the definite isolation of the specific microbe, a knowledge of its life history, the toxins it produces, etc., may be necessary to the discovery of a means by which immunity can be artificially secured. But, however that may be, I feel convinced that until we have some such method at our disposal, we will not be able to effectually control the spread of scarlet fever.

The present day mild form of the disease

renders the diagnosis of the malady increasingly difficult. Slight indispositions occur at times among children, which, though, they may be attended with some little suspicion, there is no evidence to show are of the nature of scarlet fever. In such cases there is some times a tendency to spread, but their power of infectivity appears to be very limited. It no doubt, however, occasionally happens that such a case comes into contact with a child who is more susceptible to the malady when its true nature is revealed. Such cases, together with those that are unrecognised through medical advice not being sought at the proper time, are undoubtedly among the causes of the spread of this infection.

The difficulty in diagnosis raises the question as to what is scarlet fever? I do not know, but I imagine that the disease acquired its name from the character of its rash. Now one of the most constant symptoms of true scarlet fever is the occurrence of vomiting or nausea, and a condition of tongue indicative of acute gastritis. This is preceded by a sore throat, no doubt the primary seat of infection. My idea is that the virus from the throat passes into the stomach during the process of swallowing, sets up inflammation of the mucous membrane, and is the cause of the gastritis. I am not going to contend that a patient suffering from a scarlatinal throat pure and simple never exhibits any rash, though I believe such throats do frequently occur without a rash, but my experience generally is that the more marked the gastric symptoms are, the more definite, well-marked, and often more persistent the rash is.

This points in my mind to the conclusion that it is from the gastric mucous membrane, and not the throat, that the toxins or virus is absorbed which causes the rash.

When the infective virus passes beyond the stomach, causing enteritis and consequent diarrhoea, the case in my experience is always serious and very often fatal.

Why a scarlatinal sore throat should occur even sometimes, of rather a severe form, with little or no rash I do not know, unless in these cases the gastric juice is sufficiently antiseptic to destroy the virus which gains admission to the stomach.

That cases of sore throat of the above character, though unrecognised as such, cause scarlet fever there is ample evidence to show.

The following are a few of the examples which have come under my notice. Three

young women were employed in the same office: F. W. and E. M. W. both had colds and sore throats during the Easter holidays, between April 18th and 21st, and E. H., the third, commenced with an attack of scarlet fever on April 26th following.

The maid in a certain house complained of a sore throat on January 14th, and was attended by a medical man; there were no other symptoms of scarlet fever. Seven days later a young lady staying in the house developed a well-marked attack of the disease.

E. B. commenced to be ill with a sore throat and swollen glands on February 23rd. The child improved in a day or two, and no rash appeared. She was visited by a medical man occasionally for three weeks, but showed no signs of scarlet fever. On March 2nd her sister L. developed a well-marked attack of scarlet fever.

F. H., a young woman of seventeen, had a sore throat about November 5th, but no other symptoms. Her brother Frank, aged four, who had not been from home nor playing with any other children for three weeks previously, slept with his sister till November 16th, when he commenced with an attack of scarlet fever. Eight days later another brother developed the disease also.

In the above cases the strictest inquiries could elicit no other source of infection. I could quote many other similar instances, but I think the above will be sufficient to illustrate my point.

It would appear that while immunity must be frequently of a permanent character, in certain cases it is only temporary.

A mother and child developed scarlet fever, and were treated at home. Another little boy, aged six, was kept at home, and was allowed to mix freely with those suffering from the disease. He did not take it, but about fifteen weeks afterwards, and nine weeks after the house was disinfected and cleansed, he developed the disease.

N. P., a child 1½ years old, was notified to be suffering from scarlet fever on January 29th. He had not been away from the house for a long time. But G. P., a brother, was attending a school in which several cases had occurred, and was the only traceable source of infection. On February 12th, or fourteen days after, the child G. P. was attacked with the disease.

J. I. and H. I. both had scarlet fever, and were discharged from quarantine on June 26th. After this they were frequently visited by A. S.,

up to August 24th, when the latter developed the disease.

The above are a few among quite a number of similar cases which have come under my notice.

The only reasonable explanation of such cases to my mind is that the individuals are not at the time susceptible; they do not for the time being present a suitable soil. But some little indisposition or other condition intervenes which renders them susceptible, and they fall victims to an attack of the disease.

It has now been, I think, pretty definitely shown that certain persons can act as carriers for long periods of time, in the case of some of the infectious diseases. In view of that fact, and in the light of my experience of this disease, I am convinced that carriers play an important part in the spread of scarlet fever.

We are all only too well aware of the fact that a certain percentage of patients discharged from our hospitals, at various periods, subsequently give the infection to others. I have frequently had children sent away direct from hospital to relations' houses where there were no children, and where they have been detained for varying periods up to six or more weeks, and even then, soon after their return home, another child has developed the disease.

Three cases of scarlet fever occurred in a certain house, in a very respectable family, the last of which had completely recovered by the end of October, 1906. On July 5th, 1908, a little girl aged 4½ years, one of the above children, again developed the disease. This child had not been to school, and had only played with children in the same street, among whom there was no illness of any kind, and there were no cases of the disease in the district. The only explanation I could furnish as to the cause of this case (which, of course, is only a supposition) is that this child, or some other member of this family, had harboured in the throats or nasal passages the specific microbe of this disease during the previous eighteen months.

In the case of another respectable family, a little boy had an attack of scarlet fever. He was kept carefully isolated from his sister until he was apparently quite free from the disease. But about ten weeks after his discharge from quarantine the little girl developed the disease. No possible source of infection could be traced.

H. H. had scarlet fever during July, 1907. At the end of December in the same year, he was in company with C. W. They played

with a toy, and in doing so each had to blow through the same pipe. About ten days after C. W. developed scarlet fever. No other source of infection could be traced.

I could quote other cases of a similar character. They, however, do not prove that persons who have suffered from scarlet fever act as carriers of the disease, though in my opinion they point to that conclusion.

Although a great deal of original work has been carried out in connection with the bacteriology of scarlet fever, it seems to me that nothing very definite and certain has yet been discovered regarding the particular organisms or organism which is the cause of this disease.

The bacillus of typhoid fever belongs to a group of organisms the normal habitat of the chief member of which is the intestinal canal. In the same way it seems to me to be quite possible that the specific microbe of scarlet fever may be related to one or more of the many varieties of organisms to be found in the mouth and throat. The particular species concerned may not be present generally in healthy throats, but the mouth and nasal passages offer constant facilities for the reception of organisms of all kinds, and provide such ideal conditions for their proliferation, that in the absence of any definite knowledge regarding the true nature of the infecting microbe, its life history, and as to whether it exists as a saprophyte in any form or not, renders such a theory tenable. Indeed, in the absence of such a theory, it seems difficult to account for the re-occurrence of certain sporadic cases of the disease, because it crops up at times in districts which have been quite free therefrom for long periods, and under conditions in which no possible source of infection can be traced; in fact, sometimes under conditions in which the probability of outside infection can be strongly precluded.

It has been proved that the bacillus of diphtheria can live in healthy mouths for a considerable length of time. Why not also the microbe of scarlet fever? It is only reasonable to suppose that this may be the case, and that so long as such persons remain in a healthy condition they are unaffected thereby, but when some slight indisposition intervenes, a chill, catarrh, tonsilitis, or some other condition, the microbe concerned takes on a pathogenic influence, and scarlet fever results. In this connection the following cases are of interest:—

A nursemaid returned home from a visit to

Bournemouth on January 7th with the family by whom she was employed. In the course of the journey, while waiting at an exposed station, she felt very cold, and at night complained to her mistress of a sore throat. She took a warm bath and retired to bed. The next morning she felt better, and attended to the children as usual. The next day she felt worse, and a doctor was sent for. There was no rash, and tonsilitis was diagnosed. Being no better the following day, she was sent to an infirmary. The day after her admission a rash appeared; her case was certified to be scarlet fever, and she was removed to the fever hospital. None of the children in the family she had served contracted the disease.

S. B., aged seventeen years, had been quite well previously, and there had been no scarlet fever anywhere in the district in which he resided for many months. On the morning of June 17th he got a thorough wetting, in fact wet through to the skin, and felt cold and chilly. In the evening of that day he complained of sore throat, and four days after a rash appeared. He was certified to be suffering from scarlet fever, and was removed to hospital on June 24th. His brother, C.B., who slept in the same bed with him, contracted the disease, and was removed to hospital on June 25th.

B. M., aged 16 years, caught cold on Saturday, September 21st. Her mother, who had been away, returned home on Wednesday and found her daughter unwell, suffering from a cold and sore throat. Her mother administered some home remedies. She improved and went to her work as usual on Thursday and Friday. In the afternoon of the latter day she got worse and had to return home on account of headache and nausea. Her mother found she had a rash and sent for a doctor, who certified her to be suffering from scarlet fever.

The desquamating cuticle in scarlet fever used to be regarded as highly infectious. This view is evidently not now so strongly held as formerly, and I am of opinion that even yet too much stress is still laid upon this point.

I regard the rash in this disease as resulting from a disturbance of the vaso-motor centres produced probably by the irritation of the acute gastritis present, or from the absorption of toxins from the stomach, and that it forms no part of the lesion in the disease.

The desquamation of small-pox is very infectious, but in that case the desquamation which occurs is the removal of the lesion

because it is a well-known fact that inoculations made from the contents of the vesicles, etc., will cause the disease.

In the case of scarlet fever the lesion is undoubtedly in the throat, and the mucous surfaces leading therefrom. The discharges from these surfaces are highly infectious, as well as discharges from any sores on the face or other situations, which are evidently produced by direct infection from the nasal or aural passages.

I am not going to urge that there is no infection in the peeling cuticle, because it may receive infection indirectly in many ways, but in my opinion the desquamation which occurs, apart from the above discharges, and after the partaking of repeated disinfecting baths, plays little or no part in spreading the infection of this disease.

It would appear that scarlet fever is a disease of the working rather than the middle and upper classes. I have got out some particulars in this respect for Halifax for five years, 1901 to 1905, and the following table, No. 9, shows the results:—

Attack rate per 1,000 of persons living in different sized houses. Average of five years, 1901-5:—

No. of rooms per house.	Population.	Average attack rate per 1,000.
1	2,271	8
2	19,840	4.4
3	18,387	6.1
4	18,471	4.1
5	15,750	6.5
Above 5 rooms	30,217	1.7

} average 5.5

It will be observed that the attack rate is very low among persons living in single-roomed houses, from the obvious reason that very few susceptible persons live in that class of house; but taking houses with from two to five rooms the average attack rate was 5.5 per 1,000, against only 1.7 per 1,000 in houses with more than five rooms.

I fear that I have already detained you too long upon this subject, and will therefore bring my remarks to an end.

In conclusion, it appears to me that we have yet a great deal to learn regarding this disease, the elucidation of which would involve a prolonged and careful study, and an intricate and elaborate bacteriological investigation. The inquiry would, in my opinion, have to be conducted not only during epidemic years, but also during non-epidemic periods; and the time required to carry out the necessary investigations would be too great and too prolonged to make it possible of achievement by a medical officer of health in active work.

THE SYSTEMATIC EXAMINATION OF THE EYES OF SCHOOL CHILDREN.*

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F.R.C.S. Eng.,

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TO tell you all that the title of my lecture implies in the brief space of one hour would, I think, pass the wit of man. What I propose to do is to take you in imagination into any large school, say in London, and there show you from the results of my experience what eye conditions you are most likely to find amongst the children, and how you can best set about finding out these conditions.

In entering any school the first person whose acquaintance the school doctor should make is the head-master. The friendly help of the chief of the school is of the greatest advantage to the doctor, for a good master can give information as to the character and capabilities of a child which is scarcely second, and is often superior, to that which can be obtained from the parent, and from this source the doctor can gain information that would be lost to his unaided effort. In the early days of school inspection I can remember that the doctor's reception was not always friendly; his visit was conceived to be an additional worrying inspection forced on an already over-inspected school staff; but by this time the teachers have learned to regard the doctor as a friendly helper, and they welcome and invite his assistance, even if he occasionally has to criticise.

The next procedure which I have found of profit is to make a tour of the school when all the children are in their places and to take note of the conditions of the class-rooms as regards their lighting, natural and artificial, and their ventilation; the arrangement of desks and the attitude of the children; the state and position of blackboards, diagrams, and maps; the quality of the print in the books in use; and the style of writing, drawing, and needlework taught, and the attitude of the children during these exercises. All these things come within the sphere of influence of the doctor who is investigating eyes.

*A lecture delivered at the Rooms of the Society of Medical Officers of Health, January 12th, 1909.

NOTE.—The lecture was illustrated by many diagrams and figures which cannot be reproduced. They will be found, together with much other work on school conditions, in "The Conjunction in Health and Disease," by N. Bishop Harman. Baillière, Tindall & Co., London.

As each class-room is visited, so a preliminary examination of the children is made; the doctor passes through the passages between the desks and each child is required to look straight into his eyes, and at any indication of a departure from the normal the child is marked for further examination.

Besides the class-rooms, the eye doctor should examine the lavatories of the school, particularly the wash-places, and note the condition and number of the towels, and ascertain the frequency with which they are renewed. The reasons for these points will appear later.

CLASSIFICATION OF EYE CONDITIONS.

Taking the eye conditions as a whole, we shall find that they are divisible into two great groups: (1) External diseases; (2) Functional disorders. Each of these groups has points of importance, and although for the sake of convenience we separate them, it must be always kept in mind that the association of external disease and functional disorder is most intimate, and often casual, in relation.

I.—EXTERNAL DISEASES.

Recently I examined a number of English children in the schools of the Hackney district of London. The region includes all varieties of social conditions: good residential quarters at Clapton, artisan dwellings at Homerton, and crowded slum regions at Bethnal Green. The district is representative of a great city, and the conditions found in these schools are a fair average of what you may expect to find.

The examination was made during the months of July and November of one year, and covered thirty schools, with 21,893 children of ages from seven to thirteen years. Subsequent to the examination the schools were classified according as I judged the situation of the region, the housing, and the condition of the children favourable to their well-being. Thirteen schools were found in which the children reached a fair average of cleanliness, three schools were above the average, and fourteen below. The following results appeared:—

CLEANLINESS.	CASES OF DISEASE.	PERCENTAGE.
Above average ...	19 in 2,174	0.873
Average ...	134 in 9,463	1.416
Below average ...	197 in 10,256	1.92
Totals ...	351 in 21,893	1.608

We may say that roughly 2 per cent. of elementary school children are subject to some

condition of eye disease due to a present inflammation, or to one that is past, and that we shall find twice as much eye disease amongst the poorly-kept section of the population as amongst the well-kept.

The diseases found were as follows:—

	Per cent.
Conjunctivitis ...	10.5
Blepharitis ...	74.0
Phlyctenulae ...	15.0
Effects of ophthalmia neonatorum ...	1.5
Interstitial keratitis ...	1.5
Congenital anomalies ...	4.0
Eyes lost ...	2.0

BLEPHARITIS.

Sore eyelids account for the bulk of the cases. This is an inflammation of the margins of the lids, and involves the lashes, their glands, the Meibomian glands, and the strips of skin and conjunctiva bordering the lid margins.

Investigating the cases of blepharitis at the Belgrave Hospital for Children for ten years, I found that the maximum incidence occurred at the age of four years; from then until the end of the school years there was a steady flow of cases, with a second but lesser peak of frequency at the age of seven years.

Blepharitis is essentially a dirt disease. It is true there are contributory causes other than dirt, but the disease scarcely occurs in clean children, even when these contributory causes are of equal weight. At the age of four the infants in the Belgrave region entered the infant departments, dirt and microbes had a cumulative effect. Again, at Moorfields Hospital, I found the dirtier alien patients suffered out of all proportion to their numerical standing.

Contributory causes to the production of the disease are the exanthemata and eye strain. Measles is a particularly frequent starting-point for sore eyelids: the conjunctivitis set up by the fever leaves the lid margins sodden, and a ready culture medium for organisms of which there are always more than enough about the lashes of the lids. The frequency of the fever amongst infants may account in part for the maximum incidence at the age of four years.

Next to this, eye strain may be held a contributory cause, and if it be less the cause of the onset of acute cases, it is certainly one of the most frequent in chronic cases. If the doctor will examine a class, say of girls before and after an afternoon's needlework, he will find a striking difference in the appearance of the eyelids of a number of the girls. At the

close of the lesson he will find that an appreciable number have reddened margins to their lids, and he will notice that the rate of blinking is distinctly increased. We are familiar with the never-ending work of our hearts, and the automatic nerve centres, but we scarcely give a thought to the almost equally arduous labour of the eyelids. In the space of a single working day their margins will come in contact several thousand times, more than enough to produce rawness of them were they not specially protected. Their protection lies in the layer of protecting grease poured on to the lid margins from the Meibomian glands. When the blinking is excessive, as it is when the vision is defective or when the work forced upon the eye is too severe, the protection of the grease is insufficient, the margins become sore; and they are further infected by the manner in which the child rubs its tired eyes. When the lids are inflamed the good quality of the Meibomian grease is lost, and is no longer protective; so a vicious circle of circumstances is started, and blepharitis is in a fair way to become chronic. Only scrupulous cleanliness of person can prevent these effects if the causes be left untended, and the longer they last the more difficult is the cure.

The treatment is simple enough: Clean the lids, rub them vigorously and frequently with a warm alkaline lotion (Sod. bicarb. 5 per cent.) until the margins are completely free from crusts, then rub in a mild mercurial ointment, such as the yellow oxide, of 1 per cent. As soon as possible correct any error of refraction with appropriate glasses.

PHLYCTENULAR CONJUNCTIVITIS.

This came next in order of frequency as the cause of eye trouble with 15 per cent. It must be remembered how serious is this inflammation in its lasting effects on the transparency of the cornea, and consequently on visual acuity. It is a disease of the poor and of young children. Cases are very rare in the first year of life; the maximum incidence falls from four to six years, when the milk teeth are decaying. The children very commonly suffer from chronic coryza, sores about the nostrils and lips, eczema of the face, or perhaps discharging ears. They are invariably ill-fed. At Moorfields Hospital I found the disease much less frequent amongst Jewish children than native. Jews feed their children well, and use much oil in cooking; we may note here that cod-liver oil is the best cure for the disease. I cannot enter at length into the

cause of the disease, but I may say that I have put forward evidence to show that it is not the effect of a specific microbe, but that it is an efflorescence or herpetiform eruption on the terminals of the first and second division of the fifth cranial nerve caused by peripheral irritation of collateral branches of the second division of that nerve, by septic teeth, and nasal and labial sores, in ill-nourished children. The disease accounts for more cases of damaged eyes, and therefore of diminished vision, than any other; and no better argument for instruction in oral cleanliness and dental clinics can be made than the citation of this disease.

ACUTE CONJUNCTIVITIS.

This accounted for 10 per cent. of the cases. Most of these appeared to be due to infection with the Koch-Weeks bacillus. Every school doctor should be thoroughly familiar with the characters of this organism, of the Morax-Axenfeld bacillus, and of the Xerosis bacillus. The first two are conjunctival organisms almost exclusively, and consequently the man who has taken out a course of bacteriology may be quite unacquainted with them, the more especially as they do not readily take on the saprophytic life of the laboratory, and cannot be "kept in stock." The organisms are quite characteristic, and are easy of distinction in film preparations, and I would refer you to the descriptions and pictures of them to be found in the book referred to in the footnote on the first page of this paper.

Trachoma, that scourge of Eastern countries, was extremely rare; only two certain cases and one doubtful case was found, or less than 1 per cent. of the diseased conditions. I would warn you of mistaking simple follicular hypertrophy, which is very common amongst school children, especially girls, for trachoma. Follicular hypertrophy is quite innocuous, but it is a useful indication of a general poverty of health. The follicles are mainly situated in the conjunctiva of the lower lid, and they do not cause any symptoms. Trachoma is essentially a chronic overgrowth of the stroma of the conjunctiva, and is manifested in a roughening of the usually smooth and shining conjunctiva of the upper lid; and it is associated with a series of distinct and distressing symptoms both subjective and objective. Do not miss everting and examining the upper conjunctiva of any child whose lids look heavy and drooping, for this sign forms the earliest and most distinct of the objective symptoms.

Discharging Eyes.—Children with discharging eyes should be excluded from school; notice of the exclusion being given to the proper authority so that treatment may be effected. This is particularly important when epidemics occur.

There is no more fruitful mode of spreading eye infections than a promiscuous use of towels. In residential schools each child should have exclusive use of his own towel. The towel and other toilet appliances, as face-rubber or sponge and tooth brush, should be hung on a hook and marked with the number of the child. In schools where these regulations are enforced, "school ophthalmia" is almost a thing of the past. In day schools the matter is more difficult: it is not possible to supply towels for each scholar. We best get over the difficulty by a rule allowing the use of wash-basin and towels for *hands only*, and prohibiting the washing of faces at school. Dirty children should be sent home to wash. Should an outbreak of conjunctivitis appear in a day school, the towels should be withdrawn from use. In an epidemic of mucopurulent catarrh due to the Koch-Weeks bacillus, which I investigated, the spread of the epidemic was checked when the issue of towels was stopped.

DIRT AND DISEASE.

Enough has been said to show how close and constant is the association of these two conditions. The incidence of disease, the occurrence of bacteria on the conjunctiva and on the lid margins, and the frequency of follicular hypertrophy, all show that germs, disease, or at least unhealthy conditions, are caused and increased by dirt. The school doctor will therefore inevitably find himself as much the opponent of dirt as of disease, and in effect become a teacher of the essentials of hygiene—cleanliness.

II.—FUNCTIONAL DISORDERS.

Disorders of vision are by far the most frequent source of trouble amongst school children. Of 30,000 London school children 26 per cent. were found to have defective visual acuity (Dr. Kerr's return, 1903); over one in every four children could not pass the test of reading 6/9 on Snellen's card. The conditions were worse in the poorer, overcrowded districts, for there 30 per cent. failed, and amongst the alien Jews of the East End 36 per cent. were defective. Again, girls have rather worse vision on the average than boys. In one good-class school I found 18 per cent. deficiency in boys and 26 per cent. in girls.

The effect of social environment and of sex on vision, or, it may be said, on the growth of the eye, is striking. To some extent this may be due to the early age at which poor children and girls are set to work at home, before and after school hours.

Wits and Sight.—In practical work it has been found again and again that "dull and stupid" children were so because they could not see; so, if only a half or a third of these school children who fail to pass the vision test have serious defect of vision, there is enough to account for much failure in school teaching.

*Testing the Vision.**—It is sufficient in schools to take the vision of both eyes together, unless some exceptional condition should indicate the contrary. Snellen's test card should be exposed in good daylight, but not in direct sunlight. The letters should be pointed to by a teacher to help the attention of the child. If the light be poor, shorten the distance to such a length as will allow the doctor to read the 6/6 line with his accustomed ease. (It is to be supposed the doctor has good vision, or proper glasses!)

Children over ten years of age who cannot read 6/9, and those from seven to ten years who cannot read 6/12, should have their eyes examined.

If the vision of infants under seven years of age is to be tested, the **E** test card should be used. This is made up of different sized **E** block letters in various positions. The child is given a card with an **E** thereon, and is shown how to hold it in the position of the letter pointed to. A judicious bribe of "sweets" adds to the child's interest, and better results are obtained. As a rule it is sufficient in infants' classes to select for examination those children who squint or have sore eyes, and any whom the teachers suspect of seeing with difficulty.

The inability of young children to see 6/6 does not necessarily imply poor vision, for there is in all these tests a mental factor: the greater the familiarity with the letters the more easily are they recognised.

ERRORS OF REFRACTION.

For the most part the errors amongst the younger children are those of hypermetropia with or without astigmatism. Amongst older children myopia increases, especially amongst those who are astigmatic. The condition of

* In London this is done in the first instance by the teachers, who enter the results in a special column of the attendance register. This is a great saving to the doctor.

the eye can only be determined by retinoscopy after the use of a proper cycloplegic. I would warn you against putting any serious value upon the results of retinoscopy in children when no efficient cycloplegic is used. By careful comparative tests in a large number of cases, I have found that in just those cases where one desires a useful indication of the cause of the defect in vision one is led astray; for the mere flashing of a light into the eyes of a young child tends to set up a spasm of the ciliary muscle, and so a child may appear to be myopic when it is not. Atropine or hydatropine must be used. The former is best for home use as an ointment of 1 per cent. thrice daily for a week. But when the surgeon desires quickly to paralyse the ciliary muscle, the use of the pure alkaloids of homatropine and cocaine (2 per cent. of each dissolved in castor oil by gentle heat) gives excellent results. A drop should be placed in each lower fornix, and the eyes lightly bandaged; after half-an-hour the dose should be repeated, and with the completion of the full hour the eyes will be ready. The effect of the drug will pass off in twenty-four hours, but can be neutralised in thirty minutes by the installation of Eserine 1 per cent. in castor oil.

SCHOOL CONDITIONS AFFECTING EYES.

Vision depends upon the detection of contrasts, good light is necessary to show up the contrasts. An adult can read letters in a poor light because he is familiar with the letters; a child has not this familiarity, so needs an ample light.

Windows should be large, filling nearly the whole of the children's left-hand wall of the room, right up to the ceiling; then the desks will be well lighted, and the shadow of the writing hand will not obscure the writing. Artificial illuminations at each desk should not be less than ten metre candles, *i.e.*, the light given by ten standard candles at the distance of one metre. It should be steady, and white in colour.

Desks.—The seat should be of such a height that the child's thighs rest upon it while the feet are on the ground; the desk height should be such that when the child sits erect the flexure of the elbow is just on a level with the edge. The desk should slope 15 deg. down towards the child, whilst for reading the book should be tilted on a frame to 50 deg.

Print.—The greatest contrast is obtained by leaded lines, *i.e.*, well-spaced lines, of not more

than four inches in length, and with heavy black type of the "Clarendon" style.

This is Double Pica.

This is Pica, the smallest School Type.

In the infants' classes under five years the smallest type should be double pica, and in the upper standards the type should not be smaller than pica. The paper should be hard pressed, but not highly glazed. No print should be held nearer to the eyes than twelve inches.

Writing.—Upright writing with a broad pen is the best from all points of view. Slates should be abolished: the contrast of writing and background is poor; and they are dirty—children will spit on them.

Blackboards.—The surface should be of a good dull black, and frequently renewed to prevent "shine." The board should be placed on the children's right-hand side. The letters marked on the board should not be smaller than two inches square (Snellen's D. 36).

Needlework should be excluded from infant classes; wool-work should be taught instead. In the first lessons on needlework, white calico and black sewing cotton with large needles should be used. Fine needlework should not be permitted in school. Should any girl excel in fine needlework she should be medically examined lest she be myopic!

Myopes.—Fine art, particularly needlework, should be prohibited in any degree of myopia exceeding 1 dioptré. Knitting should replace sewing, and the child should learn to do it blindfold. Myopes of 6 D. and more should in most cases be provided for in special schools.

Spasm and Failure of Accommodation.—In over-worked and under-fed children there may be complaint that "the print suddenly goes misty"—there is failure of accommodation. In some cases they also temporarily fail to see in the distance—there is spasm of accommodation. Careless examination of these latter cases may mistake them for myopes, and great harm may result from the erroneous prescription of minus lenses.

Squint.—The urgency of proper treatment of these cases cannot be too much insisted upon. Children do not "grow out of squint," but the squinting eye will surely go blind.

STILL-BORN CHILDREN.

By FREDERICK PEARSE, M.D., F.R.C.S.,
Health Officer, Calcutta.

It has always seemed to me as incorrect that still-births are not included amongst the regular statistics of births and deaths. We have, I suppose, to thank the lawyers partly for this—a still-birth not being a birth in the eyes of the law. There is also the difficulty arising from the absence of compulsory registration—the returns being consequently defective.

The physiological difference between a premature birth, a still-born, and a full-time child who dies from inherent debility within a few days of its birth is not great. Children born prematurely have a very large mortality, and the numbers of children who die within a few days of birth constitute a considerable percentage of infant deaths.

I fully admit the distinctions between these three classes, but maintain that the omission of still-births from the total numbers of births gives a false estimate of the child-producing capacity of the population.

In the City of Calcutta for 1907 there were 1,243 still-births reported, and the number of live-births registered amounted to 16,224—a percentage, therefore, of still-births of over seven. This is high, but still-born children appear to be given the same right of burial or cremation as those born alive, and so we probably obtain fairly correct figures. It is also likely that if registration elsewhere of still-births were more generally compulsory the percentage of such births would be found higher than has been hitherto recorded. The following table explains itself:—

STILL-BIRTHS IN CALCUTTA.

Year.	No. of still-born recorded.	No. of births registered.	Rate per 1,000 births.
1898	720	9,530	75
1899	933	11,004	84
1900	992	10,773	92
1901	837	9,129	91
1902	631	12,122	52
1903	936	13,182	71
1904	992	15,250	65
1905	993	15,637	63
1906	920	15,083	61
1907	1,243	16,224	76

We have unfortunately no records to show the numbers of premature births in the whole of the city before the year 1905, but since that date the figures are:—

Year.	Deaths premature births.	Registered births.	Rate per 1,000 births.
1905	684	15,637	43
1906	558	15,083	37
1907	524	16,224	32

From an analysis of returns for 1907 I find that 683 infants died from debility at birth. These deaths occurred for the most part within a few days of birth and constitute 4.2 per cent. on the number of registered births and 14.3 per cent. of the infantile deaths.

The birth rate for Calcutta in 1907 calculated on the number of females between the ages of 15 and 45 was 108 per 1,000. If, however, we add the still-births the ratio is 115 per 1,000.

The infantile death rate for Calcutta in 1907 was 293 per 1,000 registered births, but if we add the still-births the mortality of infants reaches 343 per 1,000 births.

We have in Calcutta 17 per cent. of the children born dying before the age of one month, and if we add the still-born the proportion is 23 per cent.

The inclusion of these figures makes, therefore, considerable differences. It is true that our returns in Calcutta differ from elsewhere in many particulars, but relative figures fairly correspond. It is more than a curious coincidence that the infantile mortality of a large proportion of places works out at a ratio about 10 times larger than the general mortality of the population.

THE PAYMENT OF FEES OF MEDICAL PRACTITIONERS CALLED IN BY MIDWIVES.—As an instance of the difficulty which is experienced by medical practitioners in obtaining payment for their services, the guardians of the poor for the district had decided to pay a fee to any of their district medical officers who might be summoned at the instance of a midwife, provided that the patient was too poor to obtain medical aid. The district medical officer, on being summoned to the case under review, attended, but his fee was subsequently disallowed by the Board of Guardians, who expressed the opinion that, as the patient's husband was in receipt of a net weekly wage of 29s., of which a sum of 6s. was spent on rent, and the remainder was available for the support of his wife and three children, the case could not be considered destitute. The midwife thereupon brought the matter to the notice of the Council, and we caused a letter to be addressed to the Board of Guardians suggesting that in cases where the applicant for relief is in receipt of a comparatively small weekly wage the guardians should make themselves responsible for the doctor's fee in the first instance, and, regarding the transaction as a loan, should recover the amount in small regular instalments from the recipient of relief; but this suggestion was not entertained.—*Report of the Midwives Act Committee of the London County Council, Feb. 18th, 1909.*

THE INFLUENCE OF BACK-TO-BACK HOUSES ON HEALTH.

By W. SCATTERTY, M.A., M.D., D.P.H.,
Medical Officer of Health, Keighley.

MAY here mention an interesting investigation now being made regarding the healthiness or unhealthiness of Back-to-back houses, compared with Through-houses. The first point was to get a number of houses of each class sufficiently large to give a fair average result, and at the same time sufficiently alike except as regards ventilation to make a comparison trustworthy. The requirements were met by selecting 279 houses in Parson's fields practically adjoining, or at most on opposite sides of the street, and occupied by families similarly employed and with incomes fairly approximating. The population of the two sets of houses was then found by house-to-house visitation. So far the investigation included only back-to-backs in blocks of four—a style of house superior, of course, to those in long rows without any intervening open spaces. The next point was to find the exact number of deaths which occurred in those houses during the past ten years (his period was considered sufficiently long to make the comparison of value) and these were extracted from the weekly mortality returns supplied by the Registrar. The following tabular statement shows the results obtained:—

Back-to-back Houses.	Rental. s. d.	Males.		Females.		Total.	
		Under 12	Over 12	Under 12	Over 12	Under 12	Over 12
Bingley St. 33	4 5	21	46	24	51	45	97
Bradford St. 33	4 4	9	40	12	43	21	83
Emily St. 22	4 7	9	29	13	30	22	59
Marlboro' St. 32	4 7	15	51	15	44	30	95
Grange St. 15	4 8	8	20	6	22	14	42
Total .. 135	4 5½	62	186	70	190	132	376
Through Houses.							
Bradford St. 50	5 8	19	81	26	87	45	168
Emily St. 51	5 5	24	89	32	102	56	191
Marlboro' St. 43	5 9	19	87	14	107	33	194
Total .. 144	5 7	62	257	72	296	134	553

Now 135 Back-to-backs yielded 81 deaths, and 144 Through-houses yielded 100 deaths in the ten years, while the population in 1908 in the former class was 508 and 687 in the latter. This gives a death rate of 15.9 in the Back-to-backs, and 14.5 in the Through.

A more striking difference is seen from a comparison of the deaths among children under 5. In 135 Back-to-backs with a population of 508 there were 26 deaths under 5, and 39 under 5, whereas in 144 Through with a population of 687 there were 21 deaths under 5, and 28 under 5, and yet the number of children under 12 were practically the same in both, namely, 132 in the Back-to-backs and 134 in the Through. The rates in the latter comparison were 7.6 and 4.0 respectively.

I hope next to investigate a comparison between Back-to-backs in rows, Back-to-backs in blocks of four and Through-houses.—*Annual Report, 1908.*

REVIEWS.

SCHOOL HYGIENE AND THE LAWS OF HEALTH. A Text-Book for Teachers and Students in Training. By Charles Porter, M.D., B.Sc., M.R.C.P. Edin., of the Middle Temple, Barrister-at-law, Medical Officer of Health, Metropolitan Borough of Finsbury. New Edition. Longmans, Green & Co.

This book consists of two parts. Part I., entitled "The School Child," is a sound and lucid account of the elements of the anatomy and physiology of the human body, concluding with chapters on "Sight and the Eye," "Hearing" and "The Infectious Diseases." The facts given are applied chapter by chapter to the development and school life of the child, and all the commoner diseases, deformities and defects are dealt with under the appropriate headings. The information given is based on a course of lectures given to teachers and students at the Sheffield Training College.

The chapter of "The Muscular System" ends with useful hints as to physical exercises, including their educational and developmental value. These last might well be impressed on the child as well as on the teacher—a point not mentioned here. A school child, when told to take a deep breath, is often at a loss, and has to be told to do a "breathing exercise" before the desired result can be obtained.

There is a useful section on stammering under "The Respiratory System." In treating this defect it is stated that "probably the first thing to do is to explain to the stammerer exactly what the fault is." (P. 95.) This would be likely to lead to increased self-consciousness. In the classes in connection with the Manchester Schools the habit of stammering is cured almost unconsciously by a systematic training in the control of the breath in mouth, lips and tongue exercises, and in monotoning. Again, a mirror is not used because "in this way the stammerer can see where his difficulties are" (p. 96), but in order that when exercising he may see for himself whether he be moving his mouth, lips and tongue in the way shown him by his teacher.

Five pages are devoted to their feeding: only half a page to the feeding of young children—a subject on which it is much more difficult to obtain detailed information. In dealing with verminous children the method of threatening to separate them publicly from the others in school is recommended. This is surely a cruel visitation of the sins of the fathers upon the children. A child can easily be kept apart unnoticed, if necessary. The chapter on "The Nervous System" includes the development of the motor, sensory and motor word centres, sign of over-strain, prevention of fatigue, sleep, defective children, epilepsy and headaches. It is admirably clear and to the point. The second part of the book deals with "The School Building" and a chapter on "Medical Inspection of Schools and School Children."

CORRESPONDENCE.

The Editor does not accept responsibility for the opinions of correspondents.

INFANTILE MORTALITY IN WORKHOUSES.

To the Editor of PUBLIC HEALTH.

SIR,—The Local Government Board has taken an unusual step. It has published as a Parliamentary Paper a defence of the workhouse nurseries, seeking to show that their condition is satisfactory and that there is no greater mortality among the babies born than may properly be expected. The careless reader, like the complacent Guardian of the Poor, may easily suppose that the things which the Commissioners *have themselves personally seen* in the workhouse nurseries like the damaging evidence of the official reports themselves, are all a delusion; and that the workhouse nursery is—like the rest of the sphere of the L.G.B.—the best of all possible worlds.

But let us look a little closer at this “white-washing” report. Notwithstanding the appeal that we made for official statistics of the ten or twelve thousand babies annually born in the workhouses, the only figures now vouchsafed relate to London alone. So far as they go, these are actually confirmatory of the statistics of the Minority Report. We stated that out of 8,483 babies born in 1907 in 450 workhouses, 1,050 died on the premises within that year, being 12.4 per cent. of the whole (all re-admissions being, by the way, excluded); and that the deaths during the first week were from 40 to 45 per 1,000 births. The figures which Mr. Burns has been persuaded to publish show that out of 2,653 children born in metropolitan workhouses during 1907, 312 died on the premises within twelve months of birth, including re-admissions, being 11.7 per cent. of the whole; and that the mortality during the first week was 42.2 per 1,000 births, admittedly “nearly double the corresponding rate obtaining among the general population.” If this is the case in the metropolitan infirmaries, what is it likely to be in the rest of the kingdom, where (with some conspicuous exceptions) the general mixed workhouses are older, less well-equipped, and less well-staffed than the London infirmaries? Moreover, what is the use of publishing testimonies to the excellence of the lying-in wards when what is in question is the state of the infant nurseries? I challenge Mr. Burns to publish exact statistics of all the births in the Poor Law institutions of England and Wales for the past five years, together with the corresponding infantile deaths on the premises at each period of life in such a way as to be comparable with the Registrar-General’s figures for the general population.

But the Local Government Board is apparently quite satisfied that the babies in the workhouse nurseries—with ample food and nursing, and constant attendance—should die at twice the

rate of the babies of the general population, exposed to all the risks and hazards of the average household. The excess is apparently to be fully accounted for by “pre-natal and maternal conditions.” This argument would have sounded equally valid if four-fifths of the babies had died! Unfortunately, however, it does not account for the startling differences in infantile mortality between adjoining unions in the same town (not, by the way, as is disingenuously suggested, between urban and rural populations). It may be difficult to keep down the infantile mortality of a London workhouse lying-in ward (average 42.2 per 1,000 for the first week) to the rate of the Rotunda Hospital at Dublin, *where it is less than a quarter of this figure*. But how is it that (as the officers of the Local Government Board know quite well) one workhouse nursery has *ten times as many babies die* per 1,000 births as another? Can there be all this difference between the “pre-natal and maternal conditions” of the women coming in to be confined:—and are we to take it for granted that these differences accurately correspond with the varying infantile death rates of the several workhouses? I cannot help thinking that the L.G.B. statisticians know better than that.

It is, indeed, an interesting fact that some of the workhouse nurseries (including some dealing with the poorest slums of London and other large towns) have, with all the terrible “pre-natal and maternal conditions,” actually a lower infantile mortality than prevails in the general population. I feel that, by giving in the Minority Report only the average for the whole, we failed to do proper justice to these excellent unions, which have overcome so many difficulties, and at the same time we understated our case. Why is it that such unions (to take only some of the good cases) as Stepney, Camberwell, Marylebone, St. George’s in the East, and St. George’s, Hanover Square, in the metropolis, or Ashton-under-Lyne, Stockport, and Prescott in the manufacturing districts, can all show infantile death rates comparable with those of the best maternity hospitals, and considerably lower than those of the general population, whilst other unions of the metropolis, not poorer than Stepney or St. George’s in the East, and unions in provincial towns, having populations closely resembling those of the industrial towns mentioned, have infantile death rates six, eight and ten times as great? If the adverse influence of the “pre-natal and maternal conditions” has been overcome in some unions, how is it that other workhouse nurseries actually in the same town, or dealing with quite similar populations, kill off their babies at ten times the rate, and have been allowed to do so year after year without criticism or rebuke? Unhappily, the “whitewashing” memorandum now published will encourage these bad unions in their self-complacency.

THE LIBRARY.

Annual and Other Reports.

Bedlingtonshire U.D.C., 1908, by Dr. R. S. Trotter. Chelsea, 1908, by Dr. L. C. Parkes. Blackburn, 1908, by Dr. Alfred Greenwood. Cardiff Port, 1908, by Dr. E. Walford. Isle of Wight, 1908, by Dr. J. A. Gibson. Carlisle, 1908, by Dr. J. Beard. Burgh of Govan, 1908, by Dr. J. Barras. Goole, 1908, by Dr. A. M. Erskine. Carlisle Education Committee, 1908, by Dr. J. Beard. Aberdeen, 1908, by Dr. M. Hay. Renfrew, 1908, by Dr. W. G. Stevens. Norfolk County, 1908, by Dr. J. T. C. Nash, also S.M.O. Report. Colchester, 1908, by Dr. W. G. Savage. Aberdeen, February, 1909, by Dr. M. Hay. Ayr, 1908, by Dr. C. R. Macdonald. Middleton, 1908, by Dr. F. J. Wheeldon. Tendring R.D.C., 1908, by Dr. J. W. Cook. Lexden and Winstree R.D.C., 1908, by Dr. J. W. Cook. Barry Education Authority, 1908, by Dr. W. Lloyd Edwards. Hereford, 1908, by Dr. J. W. Miller. Crewe, 1908, by Dr. G. Granville Buckley. Newport Port, 1908, by Dr. J. Howard Jones. Durham County, 1907, by Dr. T. E. Hill. Fremantle Local Board of Health, 1908, by J. W. Hope. Hunslet R.D.C., 1908, by Dr. J. Buck. Port of Manchester, 1908, by Dr. W. F. Dearden. Cardiff City Education, 1908, by Dr. E. Walford. Bath, 1908, by Dr. W. H. Symons, also S.M.O. Report. Berkshire C.S.D., 1908, by Dr. G. Trew Cattell.

SOME POINTS IN MILK SUPPLY.—The milk supply of this town, with a very few exceptions, arrives by rail per the Great Western Railway; there every morning about eleven o’clock the cans which contain the milk are opened, and the milk mixed, sieved and decanted from can to can by men and boys who plunge their dirty coatsleeves into the depths of the can, and who usually have a pipe or a cigarette in their mouths; if the sieving is not done here, it is done in the course of the round opposite the house of the unlucky purchaser who is very slow to drink the fluid thus supplied to him. It is not wonderful that milk in this town usually shows a considerable sediment of dirt in the milk jug when it has stood for a short time. I trust that in the near future some steps may be taken for the more efficient control of the milk supply or for the establishment of municipal milk depôts. That it would be profitable in a short time I have no doubt, and I cannot see that its provision is more revolutionary than that of gas or electricity, which are of small moment in the production or saving of infantile mortality.—*Annual Report of Dr. Manley, Medical Officer of Health, West Bromwich.*

To my untutored mind—I ask any mother whether I am not right in this—the following facts (none of which are refuted or denied) have, at least something to do with it:—

1. In some Workhouse Nurseries *the babies never get into the open air* from the time they are born until they die, or leave at three or four or five. This fact seems incredible, but the L.G.B. does not deny it. In fact, it sanctions placing the nursery on a fourth storey, without even balconies; and does not even suggest any means by which thirty or forty infants can be carried down four flights of stone steps for the daily airings which the doctor in a private household prescribes.

2. Whilst the nursing staff is slowly improving, in most nurseries of general mixed workhouses, the babies are still handled, in the main, by pauper women (this not being yet forbidden by the L.G.B.), many of them feeble-minded, and occasionally even imbecile.

3. In some workhouse nurseries there is not even one trained nurse in charge (this not yet being required by regulation).

4. There is no “quarantine” of newcomers; a perpetual stream of infants of 0 to 4 pours in from the worst home conditions without a probation ward, straight into the nursery. No wonder that measles and whooping cough are “troublesome”!

I am, etc.,

BEATRICE WEBB

41, GROSVENOR ROAD, (MRS. SIDNEY WEBB).
WESTMINSTER.

APPOINTMENTS.

T. H. C. STEVENSON, M.D., State Med. Lond., L.R.C.P. Lond., M.R.C.S., Medical Officer of the Educational Committee of the Somerset County Council, has been appointed Superintendent of Statistics of the General Register Office, Somerset House.

DAVID MCKAIL, M.D. Glasg., D.P.H. Camb., has been appointed Lecturer on Forensic Medicine and Hygiene and on Public Health at St. Mungo’s College, Glasgow.

WALTER R. S. ROBERTS, M.B., Ch.B., Birm., Medical Officer of Health to Ongar Rural District Council.

LA SOCIÉTÉ INTERNATIONALE DE LA TUBERCULOSE.—The following prizes are offered by this Society for competition in May, 1910, for the best treatises relating to consumption:—One prize of 300 frs., one prize of 100 frs., two prizes of 50 frs. each, two gold medals with diploma of honour, and three silver medals with diploma of honour. All contributions for competition must be sent before January 1st, 1910, under sealed cover, to Dr. Georges Petit, Secrétaire Général of the Société Internationale de la Tuberculose, 51, rue du Rocher, Paris.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856.

RECONSTRUCTED 1888.

INCORPORATED 1892.

A GENERAL MEETING of the Society of Medical Officers of Health took place at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, April 2nd, 1909, at 7.30 p.m. *Present:* Dr. E. Sergeant (in the Chair), Drs. Frank Robinson, R. A. Lyster, W. Gruggen, John Robertson, Charles Porter, John Taylor, W. H. Symons, J. Howard Jones, Herbert Jones, S. C. Lawrence, J. R. Prior, G. C. Taylor, J. Niven, J. S. Tew, W. J. Butcher, F. J. H. Coutts, A. W. J. MacFadden, H. M. Richards, F. W. Bywater, F. E. Fremantle, J. B. Fisher, J. W. Hembrough, Wm. Butler, Sir Shirley Murphy, W. A. Bond.

MINUTES.

The Minutes of the previous Meeting, held on March 12th, 1909, were read, approved and duly signed by the chairman.

PRESENTATION OF THE PORTRAIT OF SIR GEORGE BUCHANAN.

THE PRESIDENT said that he had the pleasant duty of presenting to the Society in the name of Lady Buchanan, the portrait of a most distinguished gentleman, who was Secretary of the Society from 1862 to 1869, and President from 1875 to 1877. He referred to Sir George Buchanan, who had held the post of Chief Medical Officer to the Local Government Board for 14 years, and whose distinguished career was well known to all the members of the Society. He felt sure that the Society would desire to express their thanks to Lady Buchanan and Sir George Buchanan's son for having presented a portrait which would be highly valued. A vote of thanks was accordingly passed by acclamation.

ELECTIONS.

The following candidates, who had been duly nominated, were ballotted for, and the President declared them duly elected:—

AS FELLOWS.

Julius M. Bernstein, M.B., M.R.C.P., D.P.H., Woodstock Avenue, Golder's Green, N.W.; Walter Dick, M.R.C.S., L.R.C.P., Ringwood, Hants; E. Farr, M.R.C.S., L.R.C.P., Andover; H. L. Hamilton, M.B., Ch.B., D.P.H., Eton House, Ogle Road, Southampton; F. W. Jollye, M.D., F.R.C.S.E., D.P.H., Alresford, Hants; W. K. Loveless, L.R.C.P., L.R.C.S., Stapleton, Stockbridge, Hants; Edgar C. Pern, M.R.C.S., L.R.C.P., Droxford, Hants; Geo. A. E. Roberts, M.R.C.S., L.R.C.P., Twyford, near Winchester; Clare Oswald Stallybrass, M.B., D.P.H., 78, Rodney Street, Liverpool; Edmund F. Thomas, M.R.C.S., L.R.C.P., D.P.H., City Hall, Cardiff; G. Clark Trotter, M.D., D.P.H., Paisley; J. P. Walker, M.D., D.P.H., Delamere, Wallis Road, Basingstoke; E. Croft Watts, M.D., F.R.C.S.E., D.P.H., Silverdale, South Farnborough.

AS ASSOCIATE.

Arthur J. R. O'Brien, M.B., Ch.B., City Hospital, Newcastle-upon-Tyne.

NOMINATIONS.

The HON. SECRETARY read a list of nominations for election to the Society.

ELECTION OF PRESIDENT FOR THE YEAR 1909-10.

The following Fellow, having been duly nominated, was declared by the President to be unanimously elected:—

HARRY COOPER PATTIN, M.A., M.D., B.C., D.P.H., M.R.C.S., L.R.C.P., Medical Officer of Health of the City of Norwich.

Proposed by J. N. Collins, seconded by H. W. Beach, on behalf of the Eastern Counties Branch. Dr. Pattin has also been nominated by Drs. A. Bostock Hill, W. G. Willoughby, James Kerr, John McVail, J. R. Kaye, J. W. Hembrough, Henry E. Armstrong, W. A. Bond, J. Howard-Jones, and J. T. C. Nash.

Dr. S. C. LAWRENCE inquired what was being done in regard to security of tenure of medical officers of health. He referred to those who are subject to annual re-appointment or at intervals of two or three years.

THE HON. SECRETARY explained at length the steps that were being taken in the matter, and expressed the opinion that there was a fair prospect of getting what was desired.

REFERENCE FROM COUNCIL regarding the proposed dinner of the Sanitary Service of the Royal Army Medical Corps (Territorial Forces).

Dr. F. E. FREMANTLE pointed out the desirability of a large, influential and representative committee being formed in connection with the matter, and proposed the following resolution, which was seconded by Dr. TEW:—

"That the Society of Medical Officers of Health offer their hearty co-operation in the scheme for a dinner of the Sanitary Service of the Royal Army Medical Corps (Territorial Forces) and request the President to confer personally with Dr. W. R. Smith with a view to calling an early meeting of a representative committee for the purpose of making the necessary arrangements."

The resolution was carried unanimously, the PRESIDENT stating that he and Dr. Fremantle would convey the Society's resolution personally to Dr. W. R. Smith at the close of the present meeting of the Society.

Dr. JOHN ROBERTSON then read a paper* on "Prevention of Tuberculosis among Cattle," and the following members took part in the subsequent discussion:—Sir Shirley Murphy, Drs. J. Niven, A. K. Chalmers, F. E. Fremantle, Wm. Butler, J. Howard Jones, H. M. Richards, E. Sergeant.

At the close of the paper it was resolved, on the motion of Dr. Wm. BUTLER that the bye-laws be suspended.

* To be published in a future number of Public Health.

The following resolution was then passed unanimously on the motion of Dr. ROBERTSON, seconded by Dr. Wm. BUTLER:—

"That the question of the formation of a service of Veterinary Inspectors, and the question that cow-sheds should be brought up to a reasonable standard, under a uniform code of regulations formulated by a Government Authority, should be referred to the branches for consideration."

The proceedings terminated with a hearty vote of thanks to Dr. Robertson for his paper.

North-Western Branch.—Minutes of a Meeting held at the Victoria Hotel, Manchester, on Friday, March 19th, 1909. *Present:* Dr. W. M. Hamilton (in the Chair), Drs. Peck, Sergeant, Greenwood, Wood, Young, Harper, Merry Smith, Buckley, Rees Jones, Arnold, Welsh, Wilkinson, Carnwath, Buchan, Butterworth, Fraser, Dearden, Barlow, Meredith Young (visitor), and Harold Coates (visitor). A letter of apology for inability to attend was read from Dr. Garstang.

THE SECRETARY reported on the special Council Meeting convened to consider the evidence to be given before the Departmental Committee on behalf of the Society.

Dr. Sellars (Manchester) and Dr. Stephens (Lancaster) were elected Members of the Branch.

Dr. H. M. Cargin, Resident Medical Officer, Infectious Hospital, Bootle, was nominated as a Fellow.

Dr. CARNWATH then read his paper on "The Mode of Action of the Bacteriological Filter." A discussion followed on the paper, in which Drs. Peck, Wilkinson, and Barlow took part, and a cordial vote of thanks was passed to Dr. Carnwath at the close.

A MEETING was held at the University, Liverpool, on Friday, April 16th, 1909. *Present:* Dr. W. M. Hamilton (in the Chair), Drs. Martin, Buckley, Arnold, Marsden, Wilkinson, Wood, Talent, Greenwood, Buchan, Carnwath, Hanna, Scholefield, Hutchinson, Hawksley, Fraser, Rees Jones, Sergeant, Hutt, Kingsford, Corbin, Hibbert, Paddock, Peck, Dearden, Berry, Hope, Stevens, Stallybrass, and Barlow (Hon. Sec.).

The Minutes of last Meeting were read, confirmed and adopted.

Dr. Cargin, Resident Medical Superintendent, Bootle Infectious Hospital, was nominated by the Branch for election as a Fellow.

THE SECRETARY presented his report on the last Meeting of the Council.

THE SECRETARY read a letter from the President of the Society stating that, in the evidence which he gave on behalf of the Society before the Midwives Commission, he made certain statements on which the Commission required fuller and more precise information, and he was requested to supply

requiring elucidation having been enumerated, it was resolved that a circular letter be sent round to members of the Branch, asking them to send, if possible, the information required.

Dr. HOPE read a paper on the Liverpool Town Planning Act, and pointed out some differences between that Act and the Bill now before Parliament. At the conclusion of the paper, the members present were driven in motors to see the work on town planning lines which had already been commenced, being taken along the outer boulevards, 80 feet wide, which are intended to encircle the eastern boundary of Liverpool.

The party subsequently visited Fazakerley Hospital, where they were entertained to tea and shown over the building by the Superintendent, Dr. Rundle.

A cordial vote of thanks to all concerned in the arrangements brought the meeting to a close.

Home Counties Branch.—The last ordinary Meeting of the Session 1908-9 was held on April 15th, at 1, Upper Montague Street, Russell Square, W.C. Dr. CROOKSHANK, M.O.H., of Barnes, provided the programme for the afternoon. He first of all gave the members a graphic description (assisted by photographs) of a newly designed ambulance carriage, which is on view at Messrs. Carter's, in New Cavendish Street, W. Then followed an interesting account of "A Milk-borne Outbreak of Enteric Fever," which concerned twenty primary cases and a few secondary ones.

Drs. Sanders, Howarth, Butcher, and Gerard Taylor and the President shared the discussion.

Wednesday, July 14th, was tentatively fixed as the date of the Annual Meeting of the Branch, and the invitation of the President to then visit the Garden City at Letchworth in Hertfordshire was accepted with thanks. Further details of this meeting will be sent to each member in due course.

A TUBERCULOSIS EXHIBITION.—The National Association for the Prevention of Consumption has decided to hold—and is now preparing and organizing—a tuberculosis exhibition, which will be opened in the East-end of London, at the Art Gallery, High Street, Whitechapel, on June 2nd, 1909, by the President of the Local Government Board. While not entirely neglecting the scientific aspect of the subject, the exhibition will be chiefly of a popular and educational character, and will seek, by the help of diagrams, models, actual specimens, and other means, to bring home to the people the nature of the disease, the extent of its ravages, and the possibility of its prevention and cure, as well as the methods to be employed. Popular lectures, homely talks, and lantern demonstrations will all be utilized to this end.

LAW REPORTS.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

January 13th, 1909.

BEFORE LORD ALVERSTONE, L.C.J., BIGHAM AND WALTON, J.J.

LONDON v. WESTMINSTER CORPORATION.

Metropolis Management Act, 1855, Sections 73 and 76.—Requirement of Ventilation to Drains—London County Council Bye-laws—Additional Powers of Borough Councils.

A metropolitan borough council have power under the Metropolis Management Act, 1855, Sections 73 and 76, to require proper ventilation to drains to new buildings, and such power is not taken away by the bye-laws of the London County Council relating to openings in such drains, when the requirements of such bye-laws are not sufficient for the proper ventilation of the drains.

This was an appeal from the decision of a Metropolitan Magistrate in respect of two summonses in respect of a new building in the Strand, in the City of Westminster, and two special cases were stated. The first summons was in respect of non-compliance with bye-laws of the London County Council, which require certain ventilation to the drains of new buildings. The Court held, reversing the decision of the Magistrate, that the defendant had complied with the bye-laws. The second summons was for non-compliance with an order of the Westminster Corporation, by which they required a vent pipe to be taken from the drain to above the roof of the building in addition to the requirements of the bye-laws. There were various other points taken on the facts, which owing to changes of plans were somewhat complicated. The magistrate decided against the defendant on this point also. The Court dismissed this appeal.

Avory, K.C., and Daldy appeared for the appellant; *Manisty, K.C., and R. C. Glen* for the respondents.

LORD ALVERSTONE, L.C.J., in the course of his judgment, said:—"In my judgment, it was quite competent for the council to order an additional vent if they thought it necessary, or to take away one of the vents which were shown if they thought it an improper outlet; but the responsibility of passing the plans for the drains rests with the council, and the real and only answer made to that point was that they had no power to deal with ventilation under Sections 73 and 76. I cannot take that view. I think that this section, which has been found to work successfully, was meant to apply to the state of things brought about by the continuous improvement of knowledge, and that when ventilation was found to be necessary—I doubt whether much was known about ventilation

in the year 1855, certainly nothing like as much as is known now—the local authority have power, under the words 'apparatus and other works connected therewith,' to make requisitions in regard to ventilation pipes as well as in regard to other matters connected with drains." As to the question on the bye-laws he further said:—"There is nothing in these bye-laws to over-ride the power of the council to require in a special case that there should be more than the two openings, and in ordinary circumstances two will be necessary, and, indeed, may be sufficient. But in the case of enormous structures like this—five or six tenements with separate shops, and with water-closets in each of the tenements, and I dare say upon the other floors as well—it seems to me to be perfectly impossible to suppose that the county council meant by Bye-law 8 to say whenever a man has put down two openings he shall not be subject to any requisition by the local authority in the particular case as to whether he shall have more. Therefore, while in my judgment the conviction against the appellant for failing to provide at least two untrapped openings was wrong, and ought not to stand, that does not in any way afford any answer to the neglect by the appellant to have a vent supplied which was properly required by the council under the powers of Sections 73 and 76. I think, therefore, that the conviction under the bye-laws must be quashed; the conviction under the order to supply a vent must be affirmed."

BIGHAM and WALTON, J.J., concurred.

[For full report see 73 J.P. 126.]

KING'S BENCH DIVISION.

March 29th, 1909.

BEFORE LORD ALVERSTONE, L.C.J., DARLING AND JELF, J.J.

ARLIDGE v. ISLINGTON BOROUGH COUNCIL.

Public Health (London) Act, 1891, Section 94.—Bye-laws as to lodging-houses—Validity—Unreasonableness.

A bye-law made under the Public Health (London) Act, 1891, requiring a landlord to cleanse lodging-houses let to a tenant, and which the landlord has no right to enter, is unreasonable and invalid.

This was a case stated by a Metropolitan Magistrate on the hearing of a complaint against the appellant, Arlidge, for that he, being the landlord—as defined by bye-laws made by the respondents under Section 94 of the Public Health (London) Act, 1891, with respect to houses let in lodgings or occupied by members of more than one family—of a lodging-house (as defined by the said bye-laws) at 52, Brunswick Road, Upper Holloway, within the said Metropolitan Borough of Islington, did not, during the months of April, May or June, 1908, cause every part of the said premises to be cleansed, and that a notice in writing by the

respondents was served on the appellant requiring him within the reasonable time (seven days) specified in the said notice to comply with the said bye-laws, and that the appellant had failed to comply with the said bye-laws within the time so specified, contrary to the said bye-laws and the said Act.

The appellant was the person in receipt of the rack rent of the premises, which was let to one Hatherill on a yearly tenancy, not in writing, and no right of entry was reserved to the landlord. Hatherill lives on the premises and sub-lets portions to lodgers as weekly tenants. The appellant had not obeyed the notices as to cleansing, as he contended that he had not the right to enter the house and that he would commit a trespass if he did, and he said that a bye-law which required him so to do was unreasonable and invalid. The bye-law had been approved by the Local Government Board and was limited to the borough of Islington. The magistrate convicted.

Macmorran, K.C., and Naldrett appeared for the appellant; *Avory, K.C., and Courthope-Munroe* for the respondents. The Court allowed the appeal.

LORD ALVERSTONE, L.C.J., said that he always desired to support a bye-law if he could, but he thought this particular bye-law went too far. A bye-law of this kind might be framed in many ways so as to be good; it might apply in cases where a landlord was in a position to force a tenant to do what was required, or it might provide that a landlord should take all reasonable steps or all means in his power to get the work done, or it might make the tenant liable in the first instance. There were many forms in which a bye-law might be valid, but this made it imperative on the landlord to cause the work to be done though in many cases he might not be able to obey without committing a breach of contract or a trespass. He was not really satisfied that a bye-law could be made giving the local authority the right to go in themselves and do the work without special statutory authority; anyway, this bye-law as it stood was unreasonable, and therefore void.

Darling and Jelf, J.J., concurred, and pointed out that Section 116 of the Public Health (London) Act, 1891, on which reliance had been placed by the respondents, only dealt with matters contained in the Act itself, and was not applicable to bye-laws.

WINCHESTER ASSIZES.

March 17th and 18th, 1909.

BEFORE RIDLEY, J.

SHERWELL v. ALTON URBAN DISTRICT COUNCIL.
Isolation Hospital—Infection—Alleged Negligence.

This was a claim against the defendant council for negligently carrying on an isolation hospital, in

consequence of which it was alleged by the plaintiff that his child caught diphtheria.

It appeared that in the summer of 1908 a serious outbreak of diphtheria occurred at Alton, and the defendant council had erected an isolation hospital on land adjoining the house and grounds where the plaintiff lived with his family. On September 25th, one of his children, aged seven, developed diphtheria. She had, on September 21st, while playing in her father's field, crawled under a wire fence and approached the hospital. She had also played with a kitten which had lived in the hospital. It was said that the absence of a high wall round the hospital grounds was evidence of negligence.

RIDLEY, J., held that there was no evidence of negligence, as the child might have been infected in many different ways, and entered judgment for defendants with costs.

COMPENSATION IN RESPECT OF MEAT WRONGLY CONDEMNED.—Mr. Radcliffe (Recorder of Portsmouth), as umpire, recently gave his decision in an arbitration between the Winchester Corporation and Mr. T. Hobbs, a meat contractor. Mr. Hobbs contracted with the War Office to supply the troops on Salisbury Plain and at Winchester Barracks with meat. A carcass delivered at the barracks was rejected by the authorities, and was afterwards condemned as unsound by the Winchester Corporation. Mr. Hobbs was summoned on the charge of offering unsound meat, but the case, heard before the Winchester justices, was dismissed. Mr. Hobbs claimed from the corporation £2,118 as damages, being £118 costs incurred in the defence of the summons against him, £1,000 for loss of business arising from the result of the prosecution, and £1,000 for loss of his War Office contracts, which, he contended, was a consequence of the prosecution. Witnesses for Mr. Hobbs denied that the meat was bad, but those for the corporation declared that it was tuberculous. The umpire found that Mr. Hobbs was not damaged by the seizure and destruction of the meat, apart from the other matters, except to the extent of the value of the meat so destroyed, as to which he made no claim. He was in fact damaged by the termination of the contract for the supply of meat to the camps on Salisbury Plain, and by failure to obtain acceptance of his subsequent tenders by the War Office. He was damaged by the cost of defending himself against the prosecution, and he was damaged in his business generally, and in his character and reputation by reason of the prosecution. The umpire determined that no compensation was due in respect of the seizure and destruction of the meat, but he found for the following sums: In respect of the termination of the contract for the supply of meat to the camps on Salisbury Plain, £500; in respect of the non-acceptance of subsequent tenders,

£100; in respect of the cost of defending the proceedings by the Winchester Corporation, £118 11s. 9d.; and for general damage of his trade and business and his character and reputation by reason of the prosecution, £800. Each party is to pay their own costs.

UNWHOLESOME MILK.—At Marylebone Police Court on February 26th, Alfred Massingham, dairyman, was fined £10 for having in his possession, or deposited on his premises for the purposes of sale, four quarts of milk which was unwholesome and unfit for food. A sanitary inspector who visited the defendant's premises saw there a pail containing dirty milk, seized it, and sent samples of it to a bacteriologist, who reported that the milk contained a large number of pus-cells, vegetable tissue cells, faecal matter, thorns and hair, and a quantity of organisms. The milk was exceedingly filthy and totally unfit for human consumption. The defendant had said he would have strained the milk before selling it, but the bacteriologist said that straining would not remove the bacteria. The effect on infants and invalids of using such milk would be to cause diarrhoea.

FOREIGN STEAMERS AND SMOKE.—At the London Mansion House on March 15th, the captain of a Norway steamer was fined 20s. at the instance of the Port of London Sanitary Authority, for causing a nuisance by the emission of black smoke from the funnel of the ship. A dense volume had been allowed to issue for three hours. The defence was that he did not know the regulations. The Alderman said he accepted the explanation and thought that an intimation of the nature of the smoke regulations should be supplied to captains of foreign vessels.

PARENT FINED FOR NOT PROVIDING SPECTACLES.—At Eccles Borough Police Court on March 4th, a commission agent was summoned for having unlawfully and wilfully neglected his daughter Agnes, aged 10 years, in such a manner as was likely to injure her health. The Town Clerk prosecuted on behalf of the Eccles Education Committee, and explained that defendant was charged under Section I. of the Prevention of Cruelty to Children Act, 1904, which provides that any person over 16 years of age, who wilfully neglects a child in such a manner as to cause injury to its health (including the sight) is guilty of a misdemeanour. That, the Town Clerk stated, also implied the absence of reasonable care. On September 4th last Dr. Hamilton, medical inspector of schools, examined the child at All Saints School and found that her eyesight was defective. Notice was sent to the parent calling attention to the defect and the request made that spectacles should be provided. The doctor had examined the child on four occasions since that

date and found there was no improvement in her sight nor had spectacles been provided. The schoolmaster alleged that the child was unable to do justice to the instruction that was given her for the want of spectacles. Defendant had been written to on several occasions and asked to appear before the medical inspector and the Schools Medical Inspection Committee but had failed to do so. The Council were spending a very large sum of money in endeavouring to get children to school in a condition fit to receive the instruction provided for them, and if parents would not assist by acting on the instructions of the medical officer that expenditure was being thrown away. The head master at All Saints School gave evidence and stated that the child was then at school without spectacles. He believed there was a great strain upon her through want of spectacles. She could not see anything on the blackboard without being put very close to it, and could not recognise words upon it. Her education was being retarded because of her defective eyesight. Defendant denied that he had received notes which it was alleged had been sent with the child herself, and stated that when he received an intimation that glasses must be provided he instructed his wife to take her to the Eye Hospital to get them if necessary. The Chairman said the defendant had a duty to perform to the child, and his attitude had been that he could do as he liked. It was a serious case and one for which they could inflict a penalty of £25 fine or six months' imprisonment. It was the first case that had been brought to that Court under the Schools Medical Inspection Act, but the Bench would not have Acts of Parliament played with as defendant had done. He would be fined 20s. and costs or one month, and it was necessary that what was required for the child should be done that day.

MIDWIVES ACT COMMITTEE.—The tenth meeting of the Departmental Committee appointed by the Lord President of the Council to consider the working of the Midwives Act was held at the Privy Council Offices on April 28th, Mr. Almeric W. FitzRoy, the Clerk of the Council, presiding. The following witnesses attended and gave evidence:—Miss K. Stephenson, hon. secretary of the Wiltshire County Nursing Association; Miss Lilian Trendell, certified midwife, lately Inspector of Midwives for the County Council and County Superintendent of the County Nursing Association in Herefordshire; Mrs. Elizabeth Miles, certified midwife, Hertford; Miss Alice Gregory, superintendent of the Home for Mothers and Babies and Training School for District Midwives, Woolwich, vice-chairman of the London County Council Midwives Act Committee; Mrs. Messenger, certified midwife, matron of the St. Margaret's Nursing Home, 30, Surrey Square, S.E.

THE DECLINING BIRTH RATE IN AUSTRALIA.—The continued decline in the birth rate in the Australian Commonwealth is a matter which concerns not only the politician but also the moralist. At the recent session of the Victorian Anglican Synod the matter was discussed, and it was decided to invite the co-operation of the Victorian Branch of the British Medical Association in endeavouring to secure some steps being taken by the Government in the following directions:—(1) That the manufacture and sale of preventive or abortifacient drugs and appliances be prohibited by law; (2) that advertisements of such drugs and appliances be prohibited; (3) that accommodation houses, nursing homes and the like be placed under the supervision of the Department of Public Health; (4) that the police be instructed to report all infringements and suspected evasions of the law; (5) that the Church of England invite all other churches to co-operate with her in a vigorous crusade against an evil which the law cannot cope with unless the moral force of religious belief and action is behind it; (6) that medical men and chemists (wholesale and retail) be urged to lend their assistance in crushing out of existence practices which must, if allowed to continue and grow, weaken the fibre and minimise the strength and vigour of our national life: (7) that careful and systematic inquiry be made as to the effect of modern athletic exercise on young women.—*Australasian Medical Gazette*.

STAMPING OUT SMALL-POX.—Epidemics of small-pox do not exist ready made, but grow by direct personal infection from single introductions; hence the time to be active is at the very commencement, and every re-vaccination secured early lessens the possibility of extension. In the old days a great deal was made of "stamping out" a large outbreak, and the success of a medical officer was gauged by the size of the epidemic he was engaged in "stamping out." As a matter of fact, if any considerable epidemic of small-pox exists to be stamped out, it simply means that the measures taken at the commencement have failed to control the personal handing on of the infection to susceptible persons. Such epidemics have been unknown in this city since the inclusion of St. George and Stapleton in the city area in 1897. The control of small-pox is so much a personal matter, consisting largely in never missing a clue and in correctly interpreting the meaning of clues found, that, while vaccination remains optional, communities must provide adequate hospital accommodation in case of failure; unless a strong Government should some day insist upon compulsory vaccination and re-vaccination, when, as now in Germany, the expense of small-pox hospitals will no longer be necessary.—*From a special report by D. Davies, Medical Officer of Health, Bristol*.

THE LETHAL INFLUENCE OF GRANDMOTHERS.—I have heard a great deal attributed to the ignorance of the young mother, but I find, as a rule, that the young mother can be fairly easily influenced. There is more opposition from the mother of the large family (though she may perhaps have buried most of them) or the ignorant grandmother. It is very difficult to overcome their prejudices, and they have a great deal of influence with the younger mothers. For instance, when visiting a baby suffering from diarrhoea, I was assured by the mother that she was carrying out the doctor's instructions implicitly, though she afterwards admitted, when the baby died, that she had been all along, on the advice of the grandmother, surreptitiously giving it unsuitable food, because she "thought the doctor was starving it." This is just one of many such instances.—*Annual Report of Dr. J. W. Dawes, Medical Officer of Health, Longton*.

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THE TREATMENT OF SCHOOL CHILDREN FOUND DEFECTIVE.

THE Medico-Political Committee of the British Medical Association have issued an important report on the treatment of school children found defective upon medical inspection. This report is of special interest at the present time. It indicates the tendency of the main current of medical opinion on this important question, and it shows also that there are within the ranks of the profession many confused and erroneous ideas as to what is involved in the movement for medical treatment, and how that movement affects the welfare of the community and the interests of the profession. That such misconceptions should exist is not surprising, for the subject presents problems of considerable difficulty; but it may be hoped that the lucid statement of the case in this report will do much to clear up the difficulties and to bring about a satisfactory working arrangement. At the outset the committee find that "many members of the profession have formed an exaggerated idea of the treatment which will be provided under arrangements made by local education authorities," and they point out that the chief defects for which such treatment is required are (1) defective teeth; (2) visual defects, particularly errors of refraction; (3) ear diseases, specially chronic otorrhoea; (4) nasal obstructions, etc.; (5) parasitic skin diseases, specially ringworm. These defects have hitherto to a large extent escaped treatment, and the interests of the community demand that they should now be properly treated. But the interests of the profession equally demand that these defects should be properly treated, and the committee do well to drive this point home. There is evidently some fear that the action of local education authorities will involve the transference to public officials of work that is now done by private practitioners. But, as the committee point out, this work has not been done in the past by private practitioners; it has

not been done at all; it is new work for the medical profession, and the question to be considered is, How can this new work be carried out in order to secure the maximum advantage?

The committee proceeded to discuss the various arrangements that have been proposed for meeting this new demand for medical work, and these they group as follows:—(1) Reference of children to hospitals and other public charities; (2) reference to provident dispensaries and other contract practice organisations; (3) reference to the family doctor for treatment at the parent's expense, and failing such treatment, to the Poor Law; (4) reference to private practitioners, or to special officers, paid in either case by the local education authority. Treatment by public charities is strongly opposed by the committee, on the grounds that the hospitals are not equipped for the work, that many have refused to do it, and that such an arrangement would greatly increase the amount of unpaid work done by the profession. Treatment by contract-practice under proper conditions as to remuneration, etc., is not disapproved, but it is pointed out that it is doubtful whether this arrangement would be practicable and still more doubtful whether it would be economical. Treatment under the Poor Law is considered to be impracticable and contrary to public opinion, and the committee conclude by recommending the provision of treatment by medical practitioners appointed and paid by the local education authorities. With the broad principle of the committee's recommendation we are in hearty accord, although we confess to reservations on certain points of detail, and we would repeat the warning with which the committee conclude their report: that if "the profession commits itself to oppose the treatment of school children, at the public expense, except through the Poor Law as at present administered, it will in all probability find, as in so many cases in the past, that arrangements are made in which it has no voice, and in which its interests will be disregarded."

PREVENTION OF TUBERCULOSIS AMONG CATTLE.*

By JOHN ROBERTSON, M.D., B.Sc.,
Medical Officer of Health, Birmingham.

THE only justification we have for discussing the subject of the prevention of tuberculosis among cattle is the relationship which exists between the disease in animals and men. The prevention of cattle tuberculosis must be a matter for our colleagues, the members of the veterinary profession, who I know are anxious that a beginning should be made in a systematic attempt to eradicate the disease.

Ever since the establishment of a definite service for the prevention of diseases in the human subject tubercular disease among dairy stock has given us concern, but so far no preventive measures have been taken. The disease is probably more prevalent to-day than it was 30 or 50 years ago. It is an enormous source of loss to stock-owners and butchers, to whom any reasonably effective scheme of eradication would be acceptable, if not too costly.

It has for at least 30 years been generally held by the Public Health Medical Service that tuberculosis in cattle is one of the causes of tuberculosis in man. It is unnecessary to-night to detail the reasons we have for this very strong and generally accepted opinion. Actual experimental proof must always be wanting. Even the best endowed Royal Commission cannot supply this evidence. When an opinion is based on the daily observations of those who have intimate contact with the disease, both in man and animals, and when such opinion is held almost without a single dissentient, I feel that our case is so strong that we can reasonably expect that action shall be taken on it, and that we are wrong in not pushing forward for preventive measures.

While our opinion on the general question is so unanimous, I think it will be found that there is considerable difference of opinion as to the extent to which tuberculosis in the human subject is due to the disease in the lower animals. Within quite recent years we have had assertions made on the one hand by eminent authorities that human tuberculosis is due directly or indirectly to bovine tubercle, and on the other hand that in quite a small number the infection is so derived. Personally I am inclined to believe that we have in the past over-estimated the number of cases derived

from the lower animals, and that, therefore, when the time comes that we are able to say that bovine tuberculosis is practically exterminated some of us will be disappointed in finding that the incidence of the disease in man has not greatly diminished as a result of such preventive work. Whichever opinion we hold, I do not think it weakens our contention that tuberculosis in the lower animals should be dealt with in such a manner as to entirely do away with the possibility of any person deriving tuberculosis from a bovine animal.

Stock-owners have for many generations realised what a scourge tuberculosis has been among their herds. It has only been, however, within quite recent years that any intelligent investigations have been made. We are now able to say, with some degree of accuracy, the extent of the disease among bovines, the conditions under which it is spread, and the methods, or at least some of the methods, by which it may be combated.

I find it is difficult to give a figure which will represent the percentage incidence of tuberculosis among cattle. Many thousands of dairy herds have now been tested with tuberculin with results so varying that while some herds have been found on the first examination to be quite free, others have reacted to the extent of 80 per cent. or more. To be on the safe side, in view of the available tests having been made on more or less selected herds, and in the earlier days with tuberculin of irregular action, it may be asserted with considerable assurance that 30 per cent. of the dairy stock are suffering from tuberculosis.

Obviously, great loss to the stock-owner is occasioned. The amount of this loss, if known, would probably do more to awaken interest than anything else. More or less random estimates have in the past been made, amounting in most cases to millions per year, but in most instances where the methods have been given these have indicated that only certain parts of the loss have been taken into account. The loss to stock-owners, and particularly to dairymen, arises from:—

- (a) General wasting due to the disease;
- (b) Inability to guarantee the butcher in freedom from tubercular disease;
- (c) Shortening of the milking period of good milkers by probably 50 per cent.

As regards the wasting due to tuberculosis, it is not sufficiently well known that in stock sales all over England there are many cows sold at prices from 30s. to £5, and that

there is a regular trade in such. At intervals, for a good many years, I have sent to stock sales in country districts round Sheffield and Birmingham, and find that quite considerable numbers of cattle are sold at these prices.

The uncertainty shown by the butcher in buying an old cow is an element in reducing the price. I am told that from the above two causes alone it is safe to say that the stock-owner loses on an average about £5 on each animal sold. The latest return of the Board of Agriculture (1908) indicates that there are of cattle over two years old 4,135,468 head, of which about 2½ millions are cows in milk or calf.

Another source of great but unrecognised loss to the dairy farmer is that arising from the fact that owing to tuberculosis he avoids keeping individual cows for any long number of years, as he finds that every year after the fifth or sixth increases his risk of loss. This is in sharp contrast to many of the Danish farmers, who find that it is economical to test the milk yield of every cow, to discard any which do not pay for themselves by their milk, and to carefully keep and breed from those giving a good milk yield. In this way he keeps good milkers for four or five years longer than the English farmer, and at the same time gets four or five calves from good milking stock.

There are several other minor losses to the stock-owner, such as uneconomical feeding of tubercle-infected animals, etc.

Three definite propositions have been made with a view to clearing herds of tuberculosis:—

1. The method of Professor Bang, with numerous slight modifications.
2. The method of Professor Ostertag.
3. The method of Von Behring.

The essentials of Professor Bang's method are: (1) the testing of all animals with tuberculin; (2) the complete and continuous separation of the reactors from the non-reactors, with the necessary disinfection; (3) the feeding of all calves on tubercle-free milk; (4) the repeated testing of all non-reacting animals; (5) the disposal of the reactors at the most profitable time; and (6) the slaughter of all animals with udder tuberculosis. Immediate slaughter of all reactors is not recommended by Bang on account of the financial loss occasioned.

While in Denmark last year Professor Bang informed me that already in that country between 600 and 700 herds of dairy cattle had been freed from tuberculosis. The tuberculin

and the necessary veterinary services are supplied by the State, generally through the medium of Agricultural Societies. The practical result is that since 1895 relatively a small proportion of the farmers have adopted the method. A few who had commenced to free their herds have abandoned the attempt, on account of the disappointment caused by re-infection in the sound part of the herd, or from becoming tired by the constant watchfulness and extra work involved in the separation of their herd into two distinct parts.

In cases where the udder is found involved, great stress is laid by Professor Bang on the necessity for slaughter. Compensation is paid in such cases after confirmatory microscopical examination of sections by a method which seems to be complicated, but which appears to operate well and to be quite satisfactory. Wasters are dealt with in a similar way.

Bang has demonstrated beyond doubt the possibility of freeing herds of cattle at moderate—one might almost say little—cost, and personally I believe his to be the only reasonably effective method for general adoption.

There are, however, many points of difficulty to be encountered. In the first instance, the farm buildings must be suitable for the purpose: (a) they must be hygienic; (b) they must be capable of being divided for the complete separation of the infected from the uninfected parts of the herd (preferably entirely separate buildings for the two parts should be available); (c) the cowkeeper must recognise the chief means by which infection is spread, otherwise he is liable to have re-infection and great disappointment. For reasons of economy and safety he should rear his own calves rather than buy recently calved cows (as is frequently done at present). From even tubercular cows it is possible to rear a tubercle-free herd if tubercle-free milk or boiled milk is supplied to the calves. The tuberculin used must be reliable. It is stated on good authority that at least some of the tuberculin on the market is not reliable. Then some members of the veterinary profession have had but little opportunity of using tuberculin, and others are inclined to belittle the results. Professor Bang, from his exceptionally large experience, affirms that tuberculin, when of proper quality and properly applied, is entirely reliable and satisfactory. There are a few well-known exceptions, the most palpable being that cows which may be described as obvious tuberculous wasters often give indefinite reaction,

* Read before a meeting of the Society of Medical Officers of Health on April 2nd, 1909.

and again that a recent injection of tuberculin in a tuberculous cow prevents a definite reaction. In practice, however, I am satisfied that neither of these exceptions is of real importance.

In addition to the above exceptions a small percentage of cows give an indefinite reaction. These Bang suggests should be included with the reacting part of the herd until a second or third test settles whether they are tubercular or not.

In Denmark the expense of supplying tuberculin and veterinary assistance is borne by the State. The farmer bears the cost of adapting his premises and of the extra labour involved. In return he gets, when he can guarantee his milk to come from a herd free from tubercle, a distinct advance in the price of milk. This extra is difficult to estimate, as at the same time he undertakes much additional work in securing that the milk shall be of good quality, free from dirt, and cooled at the time of milking, and kept cool till delivered at the town. One farmer told me he got 28 ore for two litres of certified and cooled milk, as compared with 21 ore for the same quantity of uncooled, uncertified milk—an increase of 33 per cent. As has been mentioned above, part only of this increase is due to the anti-tuberculous work.

Bang's method is highly thought of in Denmark. It is not universally adopted. It is not compulsory. All milk supplied to butter factories in Denmark is required by law to be raised to a temperature of 80 deg. C., a temperature sufficient to kill the bacillus tuberculosis. In several of the states in North America attempts have been made to eradicate tuberculosis by the use of tuberculin, with the slaughter of all reactors. Needless to say, the cost of the necessary organisation, the amount to be paid as compensation, and the dislocation to the dairy industry were so great as to cause the scheme, I think, to be abandoned in every case. Excellent accounts of the work and of its difficulties will be found in the annual reports of the Cattle Commissioners for the State of Massachusetts. In France, Belgium and Germany the method is in use, but apparently not on any extensive scale.

The next of the three methods I have mentioned for the prevention of tuberculosis among cattle is that devised by Professor Ostertag and extensively used in North Germany. The method is based on the statement

that all cases of bovine tuberculosis are due to infection thrown off by "open" or "infectious" cases. If such cases can be diagnosed and excluded from the herd the incidence of tuberculosis will diminish. The dangerous cases are those advanced cases in which there are open lesions in the lungs and air passages, udder, urethro-genital tract, and intestines. Professor Ostertag lays great stress on the fact that in the majority of cattle the disease is limited to situations from which infection cannot be thrown off, and that such cases are, for the time being at least, not dangerous. It is asserted that such cases seldom exceed two and a half per cent. of a herd.

In Ostertag's method reliance is placed on conjoint veterinary inspection and bacteriological investigation. The herd is submitted annually to veterinary examination, and at other times when occasion requires. The recognition of dangerous animals is often not very difficult, and as a rule in these cases the clinical examination suffices. In doubtful cases resort is made to bacteriological methods. Samples of milk, sputum, or other excretions are sent to accredited bacteriological laboratories. When a dangerous animal is found the owner is obliged to isolate it, and must slaughter it, or sell it for slaughter at the earliest moment to avoid further loss. The owner is also required to disinfect the premises. It is advised that calves be kept apart and fed on boiled milk. Various agricultural societies have been formed among farmers to carry out the method.

The method lies under the disadvantage that it is practically impossible to recognise each dangerously infectious animal the moment it becomes infectious. It is possible that an animal may be intermittently infectious.

The third method for the prevention of tuberculosis is that of Von Behring, which depends on the increasing of the resistance of young animals to the tubercle bacillus by the injection of attenuated cultures. The method has as yet had so small an application as to make it one which need not here be discussed.

In England as in Denmark there are a considerable number of herds of cattle which have been apparently continuously free from tuberculosis. Bang has shown that bovine tuberculosis is of relatively recent introduction into Denmark. Formerly the disease was unknown, and is still unknown in some of the larger islands where the importation of cattle does not occur. At the present time the

prevalence of the disease varies greatly, the local customs of the farmers probably playing an important part in this variation. If we accept the incidence on dairy cows as 30 per cent., this means that there are approximately over 900,000 tubercular cattle in England and Wales. To apply Bang's method universally is entirely out of the question even if agriculturalists be willing at the present time.

Apart altogether from the difficulty of numbers the impossibility of keeping cattle free from infection in the insanitary hovels in which cows are housed must be recognised.

I would, therefore, put forward two propositions as primary essentials:—

1. That an efficient veterinary preventive service be established, capable of increase, to meet the requirements of any scheme for eradication.
2. That the cowsheds must be brought up to a reasonable standard.

My first point is that every opportunity must be given for the establishment of an efficient Public Health veterinary staff to deal with the prevention of disease in live stock. Relatively few such appointments have as yet been made, and these have been mostly in connection with the work of the large cities. To make one veterinary inspection of the cows in England and Wales would probably require the whole time services of over 300 veterinary surgeons.

As in the case of the Public Health Medical Service, so in the case of the Veterinary Preventive Service, special training is required, and therefore it is not likely that any large service will be available for some years.

As regards the second proposition, I need say nothing as to the quality of the present buildings other than that to attempt to reduce tuberculosis in insanitary cowsheds would be a mischievous waste of money.

The practical point I wish to draw your attention to is the means by which amendment is to be accomplished. I suggest that the only way of dealing effectively with many sheds is to entirely rebuild them. Others again may be converted, provided substantial alterations are made, while yet again others need but little alteration.

In order to accomplish this end I believe it is essential that authorities should be empowered to grant loans for short periods to enable the present owners to rebuild or reconstruct their cowsheds. Without such assistance there will be real hardship on the

owners, and much resistance from agriculturalists generally. The proportion of bad cowsheds which for all purposes of milk production should be abolished varies greatly in different districts. The cost of converting could not reasonably be put on the tenant. Obviously the owner will benefit, and should be held responsible if the farm is let as one for dairy stock or capable of holding dairy stock.

Having established the two fundamental parts of any scheme for the prevention of tuberculosis it will be possible probably in the first year to inspect and ascertain the existence of cases of open tuberculosis. If the number of animals affected does not exceed two and a half per cent. of the whole, as in North Germany, this will represent probably over 50,000 animals in the first year of inspection, and if these have to be compensated at the price, say, of £5 per animal it would mean at least a quarter of a million sterling per annum in compensation alone, at least for the first year.

While this general veterinary inspection of the dairy stock is in progress it will be possible to commence the systematic testing of herds on the lines outlined by Bang. The cost of each cow tested for veterinary services and tuberculin, provided the work is done systematically, may be reckoned at 4s. per head.

I have probably said enough to indicate the complicated and somewhat costly nature of any scheme for effectively dealing with tuberculosis among cattle and the probability of delay in obtaining anything like the general operation of the scheme.

I believe that probably better results will be obtained by the administration of this new service being put in the hands of the County Councils and County Borough Councils than by retaining the supervision of diseases of animals so largely by the central authority as at present.

Pending the creation of such an effective service, it is possible for much valuable protective work to be done—work which at the same time will be of great educational value.

In Birmingham, as a result of the operation of the Model Milk Clauses, we ascertained that 14 per cent. of the churns of milk coming to the City contained the living germs of tuberculosis. This indicated the necessity of some protective measures. Already several of the large hospitals are supplied with tubercle-free milk, and at a recent meeting of the Health Committee of the City the following scheme was provisionally approved for submission to the City Council. The scheme, as will

be noted, is on the lines of that suggested in the report of the Second Royal Commission on Tuberculosis:—

(a) The scheme to apply only to cowsheds situated within ten miles of the city, and from which milk is sent to Birmingham, with the additional limitation that it shall only apply to sheds suitable for the purpose.

(b) The Corporation to supply free of charge the necessary tuberculin and veterinary assistance for the testing of the cows twice annually, and also the necessary veterinary assistance and advice in carrying out the scheme.

(c) The farmer to undertake to separate the diseased from the healthy cows, and to gradually get rid of the diseased animals. Cows with tuberculosis of the udder to be dried off and sold for slaughter.

(d) The farmer to permit the marking of animals free from tuberculosis by means of a lead button on one ear.

(e) The farmer to carry out the necessary disinfection after the removal of an infected cow from the shed.

(f) A certificate to be issued quarterly to those farmers who keep their herds free from tuberculosis, as follows:—

Quarter ending.....

I hereby certify that on behalf of the Corporation of the City of Birmingham I have visited the farm occupied by

.....
.....
.....

and examined the cows and farm premises. I found that proper precautions were being taken to keep the cows free from tuberculosis, and that they were housed under hygienic conditions.

This certificate must not be used after, 19 .

Signed.....

Veterinary Superintendent to the Corporation of Birmingham.

(g) A list of farms at which the cattle are being kept free from tuberculosis to be printed and supplied to any person in Birmingham who desires such list.

NOTE—

1. Pending the time when the herd shall be entirely free from tuberculosis, reacting animals, except those having tuberculosis of the udder, may be kept and milked with a view to the most profitable use being made of them before they are disposed of.

2. Cows purchased to replace infected stock should be bought with a certificate to the effect that they have been tested within a month and found not to react to tuberculin, or they should be bought subject to their being returned if they react to the test. Until tested they should be kept in a shed by themselves.

3. It is probable that two or three years will be occupied in freeing the herd from tuberculosis unless the farmer chooses to immediately sell reacting animals, in which case there is likely to be some loss.

THE LIVERPOOL TOWN PLANNING ACT.*

BY E. W. HOPE, M.D., D.P.H.,
Medical Officer of Health, Liverpool.

THE most suitable introduction to the consideration of the various attempts that have been made in Liverpool to lay out wide streets and boulevards would be a short note on the Liverpool "Town Planning" Act, otherwise officially called the Liverpool Corporation (Streets and Buildings) Act, 1908. This is all the more interesting as it is, so far as I know, the only Act of its kind which has been passed by Parliament, and it contains powers which are far in advance of anything that has been previously suggested.

The Parliamentary Committee which considered the Bill themselves said, in presenting the Bill for the approval of the House of Commons, that the powers were of a very exceptional character, and that other districts were not to consider the granting of these powers a precedent for them to ask for similar powers until their effect in Liverpool had been ascertained. As a preliminary it may be well to glance at one or two points in the various bye-laws which regulate the erection of buildings in Liverpool, and which are, no doubt, similar to those in other large cities in the kingdom.

Under those bye-laws the first thing the owner of an estate who wishes to build on it has to do is to send in a plan to the Local Authority, who must approve or disapprove of it within a given time. The plan can *only* be disapproved on the grounds of contravening the bye-laws. The roads may be placed in a most awkward position, but nothing can be done to prevent this. Furthermore the plan itself is no guarantee that the proposal put before the Committee will be carried out, in fact it can be altered with

* Read to the North-Western Branch of the Society of Medical Officers of Health on April 16th, 1909.

impunity provided the bye-laws are not infringed. One can point to scores of examples of inconvenient streets and awkward corners due to the haphazard way in which streets were laid out.

Under the existing bye-laws every street must be 36 ft. wide, but there is no power under these bye-laws to insist on anything more, even in the case of main thoroughfares. As a consequence, in the last ten years over £1,000,000 has been spent in street-widening only, apart altogether from housing operations, to rectify the mistakes so made, and it is estimated that another £1,500,000 will be required to supply reasonably wide streets in the built-up parts of the city.

Now with regard to the Liverpool Corporation Act, 1908, the first provision of the new Act is that no person shall lay out a street otherwise than in accordance with plans previously approved of by the Corporation. This nails the builder down to his plans which have been approved by the Corporation, and which must conform to various provisions mentioned later in the Act.

Furthermore, all streets that the Corporation consider are continuations of main thoroughfares must be so marked not only on the plans, but they must be also marked out on the ground by posts or rails before the making of the street is proceeded with.

The next important section is that which empowers the Corporation to require that a street which will form a main thoroughfare shall be not less than 80 ft. wide (*cf.* 36 ft. wide as at present). If the Corporation wish to widen the street still further the land must be purchased by the Corporation. But the compensation to be paid shall be the value of so much of the *undeveloped* land as is required for the widening, and any benefit accruing to the owner in consequence of the greater width may be set off against such compensation.

Now as to street works:—

The cost of laying out a street consists of two items: Firstly, the cost of the land, and secondly, the cost of the street works, paving, flagging, channelling, etc.

Under the hitherto existing bye-laws the owner must give the land for the 36 ft. wide street and bear the cost of the street works, which must be up to a certain standard before the Corporation will adopt the street.

Now with regard to the 80-ft. main streets, the owner is bound to give the land 80 ft. wide for the street, but he cannot be asked to spend any more than he would have been compelled

to spend if the street had only been 36 ft. wide; the street works for the remaining 44 ft. must be borne by the Corporation. Now, how does this work in practice? The Corporation wish to lay out a main thoroughfare through an estate that is about to be developed. The Corporation buys the land from the owner, forms the street, and does all the street works; then as the adjacent land becomes built upon the owner pays back to the Corporation the money paid for the land and also the amount that would have been spent on street works if it had been a 36 ft. street, the balance for the rest of the street works being found by the Corporation. Some of the roads which you will see to-day have been laid out under these conditions before the Bill was introduced into Parliament; they were very useful examples to produce before the Parliamentary Committee in favour of the Bill to show that it is a workable proposal. Another point in regard to some of these 80 ft. roads is that the cost of the street works on them has been no greater than that of an ordinary 36 ft. street. This is owing to the amount of grass margins which have been laid down, and as traffic increases these margins can be thrown into the carriage-ways and footwalks.

The Corporation may prescribe a building line in any existing street, and on giving three months' notice may require the buildings to be pulled down and the land added to the street. In these cases, of course, full compensation is paid to the persons affected, but in estimating the compensation to be paid to the owner the benefit accruing to him due to the widening of the street is to be taken into account. This formerly could only be carried out by obtaining the necessary powers under an Act of Parliament—a costly and tedious business.

Again, the Corporation may require owners of adjacent land to enter into agreements for adjusting boundaries, etc., in order to facilitate the development of building and laying out of estates; the conditions to be determined by arbitration. A very useful provision is made in Section 14, where it provides that if an owner who is laying out an estate is willing to set apart a piece of land not less than one-tenth of the estate as a garden or open space for the public, the Corporation may dispense with certain bye-laws as regards paving, flagging, channelling, or the making up of streets, and complete the work themselves at their own cost. This was impossible under the "cast-iron" bye-laws.

The difference between this Act and the "Town Planning" Bill brought in by the President of the Local Government Board is that the former gives the Corporation definite powers on definite lines without going to the L.G.B., whereas the latter gives wide general powers to the Local Government Board to frame town-planning schemes where such are likely to be of use, or approve of a town-planning scheme of any local authority where the board are satisfied that there is a *prima facie* case for making such a scheme. Time may be lost and uncertainty involved, since there are no precedents, nor "model" regulations.

All conditions of purchases, etc., causing difference of opinion between the parties concerned are adjusted under the provisions of the Arbitration Act of 1889.

THE INFANT MORTALITY IN THE MALTESE ISLANDS.

By A. CRITIEN, M.D., D.P.H., D.T.M.,
Medical Officer of Health, Malta.

ONE of the most striking features in the health statistics of these islands is the excessive infant mortality, of which the average rate for the past twelve years has been 250·89 per 1,000 births.

In a country with little or no employment of female labour and a very small percentage of illegitimacy, where syphilis and alcoholism are fortunately as yet comparatively inactive, the causes of such a waste of lives must be sought outside the range of social influences and evils.

If we glance at the infant death rate, say for the last seven years, calculated for the urban and suburban as distinct from the rural areas, we become aware of a peculiar fact, viz., that the latter are more adverse to infant life than the former, contrary to what is observed in other countries, where infant mortality in the towns is always higher than in the rural districts.

That infant mortality in Malta is in excess of that recorded for other countries may be seen from the following table:—

	1901.	1902.	1903.	1904.	1905.	1907.
England and Wales	151	133	132	145	128	132
Norway	93	75	79	76	81	?
Prussia	200	172	194	185	198	177
Austria	210	218	211	?	?	?
France	142	135	137	144	136	?
Italy	165	175	168	164	166	?
Spain	186	181	162	173	161	173
Malta	240	218	236	236	244	261

The contrast is more striking when the rates for some towns geographically and ethnologically very near to us are compared with ours, as follows:—

DEATHS OF CHILDREN UNDER ONE YEAR TO 1,000 BIRTHS.

	1901.	1902.	1903.	1904.	1905.	1906.
Naples	108	149	155	159	159	—
Palermo	125	136	147	132	—	154
Catania	141	159	184	139	189	—
Malta	240	218	236	236	244	261

In order to study the peculiar incidence of disease in these islands and to compare the same with that of England and Wales, the mortality under one year for the different diseases has been calculated and tabulated as follows. In a separate column the average rates for England and Wales have been given.

COMMON INFECTIOUS DISEASES.

The first notable fact under this heading is the absence of scarlet fever as a cause of death in Malta. This would not be so remarkable were it true only for the age group under consideration. It may be said at once that, unlike diphtheria, scarlet fever has failed to establish itself in these islands. Cases are imported and sporadic attacks occur every now and then, but although one would expect that closely aggregated communities should afford immense facilities for the dissemination of so highly an infectious disease, scarlet fever has never been known to spread.

Measles occur in epidemics at irregular intervals of from three to six years. Although a notifiable disease, the proportion of cases notified is very small, as medical advice is sought, as a rule, when the attacks are severe or when the life of the patient is in danger through some complication. The extent of an outbreak can, therefore, be gauged only by the number of deaths. During an epidemic and for many months after, deaths from pulmonary diseases show a decided increase. This is observed in a remarkable degree when the epidemic occurs in winter, which is never so cold as to check its spread.

Here, as elsewhere, measles is regarded as a trivial disease. If it once gets into a house, little or no attempts are made to shield the susceptible persons; on the contrary, the peculiar frame of mind prevails that the sooner the children all go through it the better.

Epidemics reach their acme during the winter months and die away towards May or June. In these islands as in other countries, measles is most destructive to infants between one and two years of age; but the first year of life is also considerably affected, no less than

DEATHS OF CHILDREN UNDER ONE YEAR TO 1,000 BIRTHS.

	1901.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.
Urban and Suburban	237·41	192·93	227·57	236·86	220·93	241·30	215·96
Rural	245·83	250·87	248·84	231·75	272·02	267·91	223·64

MORTALITY OF INFANTS—BOTH SEXES.

Cause of Death.		Proportion of Deaths to 1,000 Births.							England & Wales. Average. 1901-5.
		Maltese Islands.							
		1901.	1902-3.	1903-4.	1904-5.	1905-6.	1906-7.	1907-8.	
I.	Common infectious diseases	2·52	1·33	2·96	0·97	0·59	2·68	2·88	8·67
II.	Diarrhoeal diseases	96·77	93·44	94·81	95·26	110·04	107·04	89·66	25·44
III.	Wasting diseases	98·87	85·96	93·46	96·24	98·05	116·89	96·76	45·41
IV.	Tubercular diseases	10·78	4·94	3·60	4·28	2·87	3·19	2·28	5·91
V.	Other causes	31·23	33·15	41·34	39·25	32·84	31·97	29·60	52·39
All causes		240·17	218·82	236·17	236·00	244·39	261·77	221·18	137·82
I.	{ Small-pox	0·14	0·13	0·13	—	—	—	0·48	0·09
	{ Chicken-pox	—	—	—	—	—	—	—	0·06
	{ Scarlet fever	—	—	—	—	—	—	—	0·20
	{ Measles	0·14	0·93	1·48	—	—	—	2·28	2·68
	{ Diphtheria and Croup	0·28	0·27	0·26	0·85	0·23	0·51	—	0·43
	Whooping cough	1·96	—	1·07	0·12	0·35	2·17	0·12	5·21
II.	{ Diarrhoea (all forms), Enteritis, Gastro-Enteritis, Gastritis, Gastro-Intestinal Catarrh	96·77	93·44	94·81	95·26	110·04	107·04	89·66	25·44
III.	{ Premature birth	1·82	1·20	1·75	0·24	3·35	4·98	3·24	20·25
	{ Congenital defects	4·48	5·08	1·75	2·93	3·70	3·83	3·73	5·88
	{ Injury at birth	—	0·80	—	—	—	—	—	0·73
	{ Want of breast milk, Starvation	—	—	—	—	—	—	—	0·68
	{ Atrophy, Debility, Marasmus	76·89	65·04	71·24	77·16	73·24	87·47	73·29	17·87
	Asphyxia of Infants	15·68	13·23	18·96	15·89	17·74	20·59	16·48	—
IV.	{ Tuberculous Meningitis, Tuberculous Peritonitis. Other tuberculous diseases	10·78	4·94	3·63	4·28	2·87	3·19	2·28	5·91
V.	{ Erysipelas	—	—	0·13	—	0·11	0·12	—	0·30
	{ Syphilis	0·42	0·27	0·40	0·12	0·11	0·12	0·12	1·28
	{ Rickets	1·26	0·53	1·48	0·36	0·71	0·76	1·32	0·64
	{ Meningitis	0·28	0·66	0·67	1·34	0·83	1·27	1·20	2·19
	{ Convulsions { Eclampsia	5·32	3·87	4·98	4·76	4·19	3·19	2·88	14·41
	{ Tetanus	4·90	5·34	4·71	5·38	6·44	4·22	3·73	
	{ Bronchitis, Laryngitis, Pneumonia, and Broncho-Pneumonia	14·84	15·37	22·08	19·68	14·02	17·37	16·00	23·14
	{ Suffocation	—	—	—	—	—	—	—	1·92
	{ Other causes	4·20	7·08	6·86	7·58	6·35	4·96	4·33	8·51

21 per cent. of the deaths recorded during the last three outbreaks—1897-8, 1903-4 and 1907-8—having occurred amongst infants of that age.

Diphtheria must have made its appearance in Malta in or about 1857 as part of a general prevalence over the whole of Europe. It is recorded that an epidemic of malignant sore throat destroyed many lives here towards the middle of the 15th century. Whether this disease was the true *angina diphtherica* and whether other outbreaks occurred since then I am unable to say.

In 1859-60-61 we find croup causing 95 deaths; in the first two quarters of 1865 croup

and quinsy were responsible for 77 deaths. There is little doubt that the majority of these deaths were due to different localizations of the Klebs-Loeffler bacillus, but the name Diphtheria does not appear in official records before 1872.

Diphtheria is now endemic in these islands.

Diphtheria, a toxic disease *par excellence*, requires a force of resistance rarely to be found in very young children; its mortality at the age under consideration, is, therefore, very high; but as the incidence of the disease is greatest upon children of older age, its importance as a contributor to our high infant death rate is comparatively small. Of 492

deaths during the period 1896-1907-8 only 4.5 per cent. were of children under one year.

Amongst the diseases in Group I, whooping-cough is exceptionally fatal to infants; of all the deaths for the last twelve years, in fact, 53.7 per cent. occurred in the first year of life. This compares unfavourably with the proportion—40 per cent.—set down by Parkes and Kenwood, presumably for England. And yet, like measles, whooping cough is not regarded by the public with anything like seriousness.

As in the case of measles, an outbreak of whooping cough is generally attended with a rise in the number of deaths due to pulmonary diseases, capillary bronchitis or broncho-pneumonia being the most common fatal complication.

The disease is endemic. Sporadic cases are never absent, which, whenever fresh susceptible children are found, give rise to epidemics limited more or less to one or other part of the island.

Sometimes the disease assumes a more general character, but its spread is remarkably slow. The season does not appear to have much influence on these epidemics; if anything, they seem to be more prevalent during the winter and spring.

DIARRHOEAL DISEASES.—Our death rate for diarrhoeal diseases under one year is enormous.

While a saving of life is being effected at ages above one, the incidence and mortality under one show no sign of improvement.

Whatever may be the clinical features of these more or less acute affections of the gastro-intestinal tract in infants, they are true intoxications caused by abnormal fermentations due to one or more species of bacteria ingested with food, or having the intestine as their normal *habitat*.

The circumstances bearing upon the incidence and mortality of zymotic gastro-enteritis in these islands are mainly connected with the (a) atmospheric temperature, (b) feeding of infants, (c) disposal of sewage and scavenging, (d) want of cleanliness among the poor section of the population.

(a) **ATMOSPHERIC TEMPERATURE.**—The records for the last ten years indicate that the mortality curve begins to increase towards the middle of April, when the atmospheric temperature has attained about 60° F. In June, when the mean temperature is at or a little above 70° F., the deaths suddenly shoot up to a figure more than double that returned for

May. The maximum mortality is reached in July (mean temperature 75°-81° F.). It keeps very high in August; from this month it slowly falls to a minimum in February.

Whatever the relation of diarrhoea mortality to the mean temperature of the 4 ft. soil thermometer may be, the records for Malta show that it is undoubtedly affected by the atmospheric temperature.

(b) **FEEDING.**—In Malta almost every mother nurses her own baby. Infants, therefore, should stand the best chance against diarrhoeal and all other diseases, were it not for the fact that the mother's milk is supplemented with fresh or tinned milks, patent foods, biscuits, bread, soups, cooked flour, etc., whatever the age of the baby and whether it requires it or not. All the beneficial effects of breast feeding are thus destroyed by overfeeding and by the administration of the most improper food, either by hand or by the bottle. It is ignorance and mistaken kindness on the part of the mothers, combined with a strict adherence to habits handed down to them by previous generations, that are responsible for the appalling mortality under this heading. Indeed, credit must be given to the Maltese mother for being exceedingly fond of her offspring and for submitting herself most cheerfully to the burdens of motherhood.

(c) **SEWAGE DISPOSAL AND SCAVENGING.**—On the speedy removal of all excreta and refuse, so that the air, water and soil shall not become polluted, depends to a great extent the healthiness of inhabited centres. These circumstances have a very direct influence on the prevalence of, and mortality from, diarrhoeal diseases.

Up to a few years ago, only the towns properly so called and one of the suburbs were provided with a water carriage system of sewerage. They are still the only populated centres that have most of their streets and footways imperviously paved and flagged. Sewerage works in the other suburbs were not completed before 1905; since then some of the villages have been taken in hand. All the conditions bearing most unfavourably on diarrhoea incidence and death rate are, therefore, still to be found in the rural districts: streets and backyards not paved imperviously, soft stone floorings in houses, cesspools, dung and ash-heaps inside or close to the dwellings, stabling and penning of animals in ground floors and cellars, discharge of slops and refuse into the streets. It is thus that the surroundings of houses—the porous roadways and yards and

the dust-laden air—are necessarily contaminated with the various micro-organisms which are the causal agents of epidemic diarrhoea.

In the following table the diarrhoea death-rate under one for the towns and for a representative group of the country populated centres are given:—

DIARRHOEA DEATH RATES UNDER ONE YEAR
PER 1,000 BIRTHS.

Locality.	Total population 1901.	1901.	1902-3.	1903-4.	1904-5.
Towns—					
Valetta ...	53,168	90	86	86	78
Senglea ...					
Cospicua ...					
Vittoriosa ...					
Populated centres in the country—					
Birchircara, Curmi, Lia, Balzan, Attard, Musta, Naxaro, Mellieha, Zebbug, Zurrico, Micabiba, Axiak, Luca, Zabbar	53,017	102	96	120	121

The difference is very appreciable. It is due mainly to the contrast in the sanitary circumstances already referred to, and to another factor, the domestic fly—the importance of which in commenting upon the diarrhoea mortality of these Islands cannot be over-estimated.

The diarrhoea season is the fly season.

The methods of sewage and refuse disposal as practised in the rural districts, and the climatic conditions special to these islands are most favourable to the early and extended breeding of flies. In the villages they breed in swarms. Their rôle as disease carriers from the diarrhoeal excreta lying on the roadway, from the soiled clothes or the dung heap in the yard of the next-door dwelling, to the baby's food or to its very mouth, is as easy as it is unhindered.

(d) **CLEANLINESS.**—The germs of the disease are introduced into the alimentary canal with food, liquid or solid, specifically contaminated, or by the sucking of dirty objects, dirty teats, fingers, comforters and clothes. There is no other disease against which cleanliness intelligently and unremittingly applied would prove a more effective barrier than summer diarrhoea. Domestic cleanliness as observed amongst the poor section of the population is in Malta, as in most other countries, still rudimentary; its efficacy as a preventive of diarrhoeal diseases has not as yet been understood.

WASTING DISEASES.—Congenital debility is the largest contributor to the very heavy yearly death toll exacted by the diseases in this group. Although to a certain extent “debility” is the realm of the undefined and the undiagnosed, there are causes at work all through the period of gestation which, while permitting the child to be born alive, considerably jeopardise its chance of survival.

Alcoholism, syphilis, and factory work have not as yet made themselves much felt in the production of weaklings. The most operative cause in this respect is frequent childbearing where the struggle for life is hardest. Confinements follow one another so closely that the mother has no time to repair the great strain every child must make on her whole organism before and during birth. This together with injudicious and wasteful suckling, malnutrition, overcrowding and unmindfulness of the first laws of health, is responsible to a great extent for the production of the congenitally weak that contribute so effectively to raise our infant death rate.

Although asphyxia of infants is more intimately connected with the various complications of full term labour than with prematurity, the large mortality rate for the latter in the returns for England and Wales suggests the probability that it includes also the deaths from “asphyxia,” which in the local returns are shown separately.

TUBERCULAR DISEASES.—It is not safe to draw any conclusion as to the prevalence of tubercle among the infant population of these islands from the tabulated death rates.

The predominant certified cause of death is tuberculosis of the mesenteric glands, or *tuberculosis mesenterica*. Tubercular peritonitis, enteritis, meningitis and generalised tuberculosis represent a very small minority. If due consideration be given to the fact that goats' milk, almost the only kind of fresh milk used in Malta, has very rarely, if ever, been found to contain the specific bacillus, one would expect the mortality rates to be smaller.

The sudden drop in the figures for 1902-3* may, in part, be accounted for by the separation of “leucocythæmia” from “tubercle” in the tabulation of diseases causing death. A corresponding rise is observed under deaths from “other causes.” There is little doubt that a better designation of disease and better diagnosis are helping to gradually lessen our

* The average death rate for all forms of tubercle for the period 1902-2 to 1907-8 is 1.429 per 1,000 persons.

tubercle death rate, so that it may represent the true proportion of infant life lost through this disease.

In the case of *tabes mesenterica* especially, the accepted symptomatology represents, in the words of Marfan, *un tableau de fantaisie*. Most of the symptoms, whether physical, functional or general, are not pathognomonic; the others are not very easy of determination. It is likely, therefore, that many deaths are being justly referred to chronic gastro-intestinal catarrh, a disease incomparably more common at the age under consideration.

OTHER CAUSES.—With the exception of rickets, all the diseases in Group V. show a substantial asset in our favour. This is more gratifying as the group includes "convulsions" and "diseases of the respiratory tract," both very common amongst infants.

With reference to our tetanus mortality, it must be said that, if the same pathogenesis be admitted to hold good for the disease as observed at ages over and under one, a more enlightened application of asepsis and a proper knowledge of the etiology of the disease on the part of midwives ought to render *tetanus neonatorum* a very rare accident. It is true that the disease is appreciably less frequent in cold climates, but our tetanus death rates are much higher, when compared with those of England and Wales,* than the mere influence of climate should account for.

Underlying the etiology of nearly all the diseases causing death in infants are two conditions which, in my opinion, should not be lost sight of in accounting for our excessive infant mortality. I refer to the high birth rate and to the great density of population in these islands.

During the last twelve years the birth rate has never been lower than 36 and has even gone so far as 41 per 1,000. In this age of vanishing birth rates these are admittedly high. They are due to exceptional fertility and early marriages. From the last two census returns, in fact, it appears that out of every thousand women of ages 15-20, seventy-nine had contracted marriages in 1891 and sixty-four in 1901. Similarly, the number of children born to every thousand married women of ages 15-45 was three hundred and thirty-six in 1891, and three hundred and forty-three in 1901.

The density of the population (census 1901), were the inhabitants evenly distributed over

* England and Wales.—Tetanus.—Deaths of children under one year to 1,000 births: 1904, 0.08; 1905, 0.07; 1906, 0.08.

the whole area of these islands—117,361 square miles—would be represented by 1,671 persons to the square mile. In the least crowded village and town it would be expressed by 19,877 and 106,894 respectively. All these figures are exceptionally high, and are the result of overcrowding on space as well as in dwellings.

These conditions, on account of their intensity, are peculiar to Malta.

Whilst overcrowding promotes diarrhoeal mortality, exuberant natality is intimately connected with a high debility death rate; and it is due to the enormous loss of life from diarrhoea and debility that our infant mortality compares so unfavourably with that of other countries.

THE CAUSES OF INFANT MORTALITY.—More than half the deaths occurring during the first year of life are practically, so far as the infants themselves are concerned, non-preventible, and are due to sociological causes, such as the marriage of the unfit; the inability to obtain sufficient food in a certain section of the community; the squandering of potential vitality on alcohol; the vitiated taste for stimulating rather than nutritious foods; the consumption of patent medicines, which, frequently taken, lower the vitality, and at times are used undoubtedly for ulterior purposes, and which, while not acting as desired, result in the production of weaklings; and the indifference of the community in general to the science of Eugenics.—*Annual Report of Dr. F. Hutton, Medical Officer of Health, Sedgefield Rural District.*

THE SANITARY CONTROL OF NOMADIC GIPSIES.—Considerable trouble was given during 1908 by bands of nomadic gipsies who encamped on lands in a part of Mortlake, adjoining Richmond. Police court proceedings were instituted in many cases against gipsies whose names could be obtained, for contravention of the bye-laws respecting water supply to dwellings. But, almost always, before the summonses could be served the camp was struck, or if the summonses were served, a move was made before the hearing came on. As a matter of fact, objectionable as the presence of these nomads no doubt is to dwellers in the vicinity of the encampments, no nuisance in a sanitary sense is caused by them in this district as a rule. It was suggested that the proper means of dealing with the annoyance was for the owners of the property to fence in their lands, and after correspondence, this was decided on by them. Bye-laws specifically dealing with these encampments might perhaps be framed, for application to urban districts.—*Annual Report of Dr. Crookshank, Medical Officer of Health, Barnes.*

REFUSE DESTRUCTORS AND THE PUBLIC HEALTH.

By A. E. THOMAS, B.A., M.B., D.P.H.,
Medical Officer of Health, Chester.

SOONER or later it falls to the task of every medical officer to report to his authority on the advisability of erecting a refuse destructor in his district. The following observations are meant to suggest the lines such an enquiry may profitably follow, and to indicate in some measure how it may yield useful and fruitful results.

In a modern plant the route taken by the refuse is, briefly, the weighbridge, the approach to the tipping shed, the tipping floor, the hopper, the firing space, and, finally, the cells and combustion chamber, whereas the course traversed by the fumes and gases is as follows: the combustion chamber, the mixing or cremating chamber, the water tube boiler, the air heater, the downtake of the flue, the flue, the dust catcher or dust chamber, and the chimney shaft, to emerge at last into the open air.

The air heater here mentioned consists of a series of tubes placed in the flue at the back of the boiler, and conducts hot air to the ashpits of the cells, promoting rapid drying of the material burnt, and a higher temperature of combustion.

When combustion is completed the ashes are "clinkered" and delivered into a barrow or other container or on the clinkering floor, and may then pass successively through the quenching shed, the cooling chamber and the storage house or yard, whence they may be sold for grouting, for manure or other purpose, or delivered for further development in the plant of some subsidiary process.

The term "feed" refers to the mode in which the raw refuse is delivered into the cell or furnace.

The feeds at present in common use are the front feed, back feed, and the top feed.

Two special varieties of top feed are the truck feed and tub feed.

The front feed, in which the refuse is shot into the front of the furnace and later raked out through the same door, is very dirty and offensive.

The raw material and the clinkers tend to get mixed together and, when clinkering takes place, pieces of the unburnt material are conveyed by careless workmen to the storage

chamber or yard and give rise to serious nuisances.

The back feed, in which the refuse is delivered at the back of the furnace and the clinkers raked out through the front, is one which may be worked in cleanly manner, but this depends upon the careful supervision of the engineer in charge and the foreman.

The top feed simple, in which the refuse is delivered and temporarily stored on the roof of the furnace to be later raked into the cell through a small aperture in the roof, is unsatisfactory. The furnace roof acts as a drying hearth; the refuse gives off noisome gases, and in summer harbours myriads of flies.

In the truck feed the refuse is delivered directly into trucks with open tops and stored there temporarily. These trucks have collapsible bottoms which are released automatically when the trucks are drawn over the furnace roof, delivering the contents into the cell below. This feed is capable of cleanly working, and need not necessarily cause a nuisance.

In the tub feed the refuse is not touched by hand but shot, directly after arrival at the works, into large wooden box containers with collapsible bottoms which deliver their contents into the cells by means of a very ingenious mechanical arrangement.

The refuse is, pending treatment, stored in the closed tubs which are deposited, after filling, in a charging room. By this means the offensive smell due to open storage, and the drying hearth, and the plague of flies, are all abolished.

In the tub feed the aperture in the cell roof is, during cremation, closed by a water seal.

The furnaces fall into two main groups—those possessing separate hearths, and those partaking of a continuous hearth. In the latter the cell roofs are also continuous and appear in vertical section as narrow semi-ellipses apposed near the ends of their major axes. The cusps formed by this device are asserted to form eddies in the incandescent gases which promote the mixing and efficient combustion of the highly heated and burning fumes with the gases which become locally cooled when a cell door is opened for charging.

In this type it is usual to find that when the cell door nearest the downtake of the flue is opened that there is an increase of "green

gases" through the chimney into the open air; it is not uncommon to find foremen who contend that, by smoke observations from the outside, they are able to state which furnace is being charged, and it is difficult to see on hydrodynamical grounds how the presence of these cusps or the character of the roof surface can lead to "vortex-delay" in the end cell, which must be postulated if efficient combustion is to be achieved during the time when it is being charged.

It is not meant that this increased issue of smoke is such that proceedings might be successfully instituted under the Public Health Acts—far from it; the smoke may be less than that which is sent out by an ordinary dwelling-house.

In the separate hearth system the green gases from the newly charged cell pass into the cremating chamber, where they meet the now incandescent gases of the cell charged, say, an hour ago, and almost ready for clinkering.

The positions of the fire bars and the holes in them require careful adjustment for effective combustion; sometimes it is found necessary to drill extra holes. If this adjustment is not accurate, or if the holes on the front of the fire bars are not wide enough, unburnt material may actually remain unburnt throughout the firing or may cause much smoke.

It is necessary to protect all ironwork, *e.g.*, the furnace door or the water seal container, by a layer of fire bricks, which may be loosely built up in the first case or permanently placed in the second. In the absence of these protecting layers, the doors and the water seal container have been known to crack. Generally speaking, the less ironwork there is in or near the furnace, the better and more durable the furnace.

In the furnace construction, for arches and for flues, bull-head bricks are essential; there is a case on record of a flue, built by a reputable firm, with two rings of 4½-in. bricks, which fell in shortly after the destructor began to work.

Clinker boxes, in the shape of sunken troughs, placed inside the furnace and near the door, are useless, and eventually may have to be bricked in, leading to waste of otherwise available combustion surface.

The forced draught may be by steam, by hot air, or by cold air.

The clinker from steam jets, or from wet refuse, is, in some towns, said to be more

friable and more easily crushed than from dry treatment.

In some installations, steam jets alone have been found to be a failure, and are now only kept as standbys.

With the hot air jet, the clinker tends to get blown into holes through which, unless continually stirred, cold air gets in and causes smoke.

The objection to the cold air forced draught is obvious. In some cells, whenever the front door is opened (as, for example, in clinkering) there is a great inrush of dust into the building from the outside; it therefore becomes expedient to have one common cylindrical chamber for the forced draught, traversing the whole length of the cells, but with a valve to each cell which may be closed whenever the cell door is opened.

The fans are best driven by electrical power if available, and should be placed apart from the destructor building, as otherwise dust gets into their bearings and detracts from their efficiency.

The use of electrical power may do away with the noise of the pump or engine exhaust, which takes place every three or four seconds, and which, in many places, has been the sole cause of complaint.

In connection with any enquiry, a surprise visit should always be paid, as otherwise the opponents of any scheme will allege that the conditions observed had been previously arranged and could not be accepted as normal.

Smoke and grit observations should always be taken, say, for two hours during the day time, and, in addition, especially when the shifts are being changed and during the dinner hour, as it is at these periods that nuisances, if present, are most likely to occur.

The smoke observation should include the duration of each variety—black, brown, blue, and white, the length of the longest trail in air, and the direction of the wind, fixed by compass, and by a line joining the destructor chimney to some house or other building.

Grit and flue dust observations may be made by exposing large sheets of double foolscap white paper covered with a thin layer of glycerine underneath the smoke trail at varying distances from the chimney base, and when this has been done, repeating the experiment twenty or thirty yards to the right and to the left of the trail. The colour and consistency of the dust caught in this way may be compared later with the actual flue dust in the works.

It is advisable to note whether any change

in the amount or character of the smoke or grit occurs when charging or clinkering is in progress, or shortly after. The occurrence of offensive smells, reasonably attributable to the smoke, may be marked at this point.

The refuse at the present day, owing to the introduction of gas fires and stoves, is not nearly as heavy or of the same calorific value as it was some years ago.

Now it is chiefly waste paper, garbage, and a minimum of coal or cinders.

In business towns it is found that on Tuesday and Friday the amount of paper is excessive; after Good Friday and after Saturday night, fish skins, fish bones and fish refuse are abundant; all these are liable to cause nuisance and give difficulty in combustion. Great care is necessary in supervising the charges—thus, when the refuse contains much vegetable matter and little else, the vegetables are held back and sent in piecemeal with other loads. So, in the case of builders' refuse, which is sometimes improperly sent to the works; this is either rejected and sent back, or, if containing any laths or woodwork, burnt occasionally with other matter.

In a front feed the refuse is from time to time heated up when clinkering is in progress, giving rise to offensive smells, especially at Christmas time. During holidays, owing to the accumulation in the hoppers, the lower strata begin to ferment and evolve noisome gases, and the whole mass may harbour innumerable flies.

The same holds in some kinds of top feeds. The destruction of pigs affected with swine fever or anthrax gives a lot of trouble to the "top men."

In some installations the refuse is subject to preliminary sorting out. On the whole, this is not generally advisable; the tins and iron cans should be separated from the rest after cremation and stored in a convenient place or otherwise dealt with.

The tipping floor and shed should be roofed in, well enclosed on three sides, and well ventilated. Clinkering in the open yard and quenching with a hose and water cause a lot of smoke and dust which are very offensive. Some plants provide a quenching chamber with a water jet in the roof and an arrangement for drawing off the gases so released and conducting them into the cells. Such a chamber may be most necessary in installations near inhabited houses, and should be used.

Covered-in storage accommodation should be provided for the exhausted clinker; it should not be allowed to lie loose in the yard to be blown about by the wind.

A dust catcher or dust chambers may become necessary; these are usually situated at or near the base of the chimney, and are chambers whose plan is, to all intents and purposes, a spiral.

There may be no projecting buttresses in the line of the gases, and no mechanical rotary contrivance for inducing centrifugal force. The makers of one variety state that "the whole principle of the apparatus is that the gases enter in such a manner that they are bound to circulate on a circular path in the interior of the dust catcher and throw the dust to the outside, when it passes through a slot into an outer pocket."

The working model which these makers exhibit certainly appears to bear out this claim, though, on theoretical grounds, its truth may seem doubtful.

Dust removing and flue cleaning mean an extra expense which is often forgotten in the original estimates. It may amount to a considerable sum in the year, especially if done on Sunday—charged at time and a half.

In one town the boiler tubes were cleaned by a forced draught, with the result that particles of dust and charred material were alleged to have been driven right through the chimney.

It is an excellent device to have a stout wire netting of small mesh, one to one-and-a-half inches, placed at the chimney base to prevent the possibility of this happening under any circumstances.

It has been found that there is a tendency for the men on the night shift, or towards the end of the day shift, to become slack, so that smoke is allowed to issue.

This may possibly be prevented by adopting some form of automatic recorder: for example, a chart showing the amount of energy derived from the destructor plant and consumed in producing current, a carbon dioxide recorder, or a pyrometer. The objection to the pyrometer when placed in the combustion chamber is the cost. The part placed inside the chamber is apt to fuse, and a new one is expensive. This may be prevented by putting the pyrometer in some situation where it is not liable to fuse, and where the difference of temperature between the site and that prevailing in the

combustion chamber could be known within limits.

It has been found advisable to keep the destructor idle for the first week or more, that all the complaints may be received before working commences.

Other authorities have deemed it expedient to burn nothing but coal or coke at first, with the same end in view.

The cremation of fish offal, collected in closely sealed tins has given rise to considerable smell and nuisance. In one instance this was abolished by putting a fresh lining to the combustion chamber; in the first one the bricks were too porous, and the violence of the forced draught induced cold air, it is said, through the pores of the bricks or joints of the brickwork.

It may be necessary to erect an anemoscope (an automotic wind direction recorder); in the case of one complaint it was definitely shown by this means that the wind was blowing away from the site of the alleged nuisance, which therefore could not have been caused by the destructor.

In one town many complaints were received before the destructor began to cremate refuse. Whatever means be adopted, however, it must be remembered that no human action can render any installation fool-proof or wiseacre-tight.

There are two well-authenticated cases on record where the smut and dust due to fires in cork factories were attributed, in the early days, to destructor chimneys many miles away.

Nuisances are, for our purpose, of two kinds: those remediable under the Public Health Acts, and those permitting of remedy only at common law. The latter, which include grit nuisances, often depend upon the ingenuity, the suave plausibility of the advocate, and the credibility of the jury; they may be often sentimental and costly. In most cases, and especially where the considerations of site are unfettered, the leading firms may safely be left to devise satisfactory erections, but in towns where difficulties of site arise and local opposition is acrid and persistent, the following items may call for most careful consideration and adjustment:—

1. The careful grading and supervision of all refuse whenever excessive paper, vegetables, or builders' rubbish are delivered.
2. The construction of the tipping floor so as to be roofed in, well enclosed on three sides, to be well ventilated and keep clean.

3. The provision of closed storage accommodation for the refuse awaiting treatment in clean, well-ventilated rooms. This is especially important during holiday time and at the end of the week.

4. The provision of free ventilation for the charging floor and room.

5. The provision of a quenching shed for the clinker, with appliances to take off the water gases or to allow the clinker to cool off in a well-ventilated, airy cooling chamber far removed from dwelling-houses.

6. The provision of storage accommodation for the exhausted clinker under cover.

7. The provision of a dust chamber or dust catcher.

8. The provision of a silencer for the exhaust or the employment of electrical power.

9. The provision of electric fans to be placed outside the clinkering room.

10. The avoidance of subsidiary processes which give rise to noise and smell.

11. The adoption of a careful method of cleaning the boilers and flues.

12. Careful attention to the cleanliness and ventilation of all details.

The ideal of a destructor is one in which there is no appreciable dust, grit or offensive smell in the buildings, details or environments, and in which no dust, grit, charred material, black or brown or green smoke issues from the chimney. This does not exclude steam. The ideal destructor would be one in which the vapour issuing from the chimney consisted of steam and colourless gases only. These gases, though colourless, might not necessarily be inoffensive.

Whether this ideal is at present realised is still open to debate, but even when all the difficulties have been overcome it must still be borne in mind that the efficiency of the plant depends in a large measure upon the integrity of the workmen, the tact and resource of the foreman, and the care and supervision exercised by the engineer in charge; in a word, upon the hearty co-operation and general good management prevailing throughout the whole establishment.

THE honorary degree of LL.D. of the McGill University of Montreal will be conferred on Dr. George A. Gibson, M.D., D.Sc., F.R.C.P. (Edin.), at the Medical Convocations on June 9th. The Inaugural Address of the Medical Faculty of the McGill University was given by Dr. Gibson in September last.

THE PROPULSION SYSTEM OF VENTILATING AND HEATING BY WARM AIR.

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IN December, 1907, I had occasion to visit Provanside Higher Grade School, North Montrose Street, Glasgow, in order to demonstrate to teachers in training its general design and furnishing, the shape and size of the class-rooms, their mode and amount of lighting and the system of heating and ventilating used in the school. As it was my first visit and I was new to my duties, I was glad to avail myself of the kind offer of the headmaster, Mr. William Marshall, M.A., to act as our guide. I soon found that he was an expert in all those matters we had come to study, and that especially in regard to the system of ventilation in use in the school—the propulsion system—he was able to impart to us new facts of the first importance. Since that time I have taken a renewed interest in ventilation methods, and I have to acknowledge my indebtedness for the stimulus received by what I saw and heard at Provanside.

The propulsion system is described by most authors in similar terms to the following: Air is drawn in to the basement of the building by suction action of a fan. This air passes through a screen of horsehair, jute or coke (between wire net), the screen being kept moist by a stream of water constantly flowing over it. The washed and moistened air is then passed over heated steam pipes, arranged in coils, and passing through the fan is propelled into ducts where further steam-heated pipes may be placed. These ducts give off side channels if necessary, and from these shafts run vertically to each class-room, opening on one wall eight or nine feet from the floor. An exit shaft runs from the floor level vertically to the roof and is usually placed on the same wall. At the foot of the shaft delivering the air to the class-room, radiators are placed, to enable special heating of any one class-room, and these are also useful in certain emergencies. The shaft removing the air from the class-room has an opening on the level of the class-room ceiling, which opening is kept closed by a shutter unless under certain conditions. A coil of steam-heated pipes is also described as existing outside the screen, but only for use in frosty weather. The windows and doors are kept closed. A spray is

also sometimes present in the main ducts for increasing humidity.

When the system is examined in actual use, it is found that in almost every case the above description is accurate, *i.e.*, that the incoming air is first washed and then heated and delivered to the class-rooms.

The advantages of the propulsion system are usually stated as these:

1. The source of the air supplied is under control.
2. The ventilation is continuous.
3. Heating is accomplished at the same time.
4. There are no draughts.
5. The air is washed.

The disadvantages are:

1. It is expensive to instal.
2. It requires skilled attention.
3. In the event of breakdown and the windows having to be opened, the air heated by the radiators at the foot of delivery shaft is often not sufficient in cold weather to heat the rooms.
4. The air delivered is usually too dry, and has sometimes a burnt smell. This latter is alleged to be due to the steam pipes being heated above 228 degrees Fahrenheit.

When we study the system in actual use the items among all these advantages and disadvantages which are most generally and most loudly proclaimed are that the air is too hot or too dry, or too hot and too dry. The discomfort arising from these causes is so great that, in some cases, the system is tacitly abandoned and the windows are opened; in others, it is used discontinuously. When complaints are made by the teachers and referred by the School Board to the engineers, the usual answer is that the system should work well if properly attended to, and that the service must be inefficient. It is the purpose of this paper to show that as usually installed the propulsion system is bound to labour under certain grave disadvantages, and that these can usually be removed by alterations in the arrangement of the parts.

To come back to Provanside School. When first fitted in, the air was sucked in by two ducts 6 ft. by 7 ft. each, and each of these was blocked by a jute screen kept wet. Inside there was a large space where the air, after passing through the screens, mixed, and was heated on stacks of steam-heated pipes. The air was then sucked through two circular

openings 6 ft. diameter by a fan placed in each and propelled up two long ducts with side branches from which the vertical shafts opened to the class-rooms. As the air left the fans it passed over two large stacks of pipes, and at the foot of each vertical shaft a radiator was placed in the shaft. The instructions were to put on the steam on all the coils of pipes and a little on all the radiators. Here was an elaborate system with spacious passages, and yet when tried it would not work. Sufficient air could not be sucked through the screens by the two powerful fans, and sufficient steam could not be supplied by the powerful boiler to heat the miles of piping. The most clamant want was the need for air, and to meet this, after considerable delay, the screens were removed altogether and a supply of hot air sent to each class-room. Later a new screen was erected inside the first row of heating pipes and in the large space into which the two ducts delivered the air. It was then found that the fans were quite able to aspirate sufficient air through the larger screen in the new position. It was also discovered that the air could be heated with very much less piping in use, until it was finally demonstrated that all the heating required was that given by one stack of pipes *outside* the screen, and that the others inside and the radiators in the shafts were rarely, if ever, needed. This finding was arrived at six years ago and has been found perfectly correct year after year since. During the summer of 1908 a quarter of a mile of piping was removed from the passages because it was never used and was helping to impede the current. When the last change was made, namely, to only use the heating pipes outside the screen, the air in the class-room became much more agreeable, and this improvement has persisted. It may seem strange that such happy results having been obtained at the Provanside School in 1903, the other schools with propulsion systems under the same School Board and working unsatisfactorily, should not yet have had any rearrangement made in the order of their parts. Yet it is so, and, as I hope to show, these schools are still suffering from too dry air. It is far stranger that inventors of such systems should display such lamentable ignorance of principles which have been enunciated time and again, and which have been violated in the usual mode of installation.

Before discussing these principles, let me give some observations which show clearly the great difference in result from the two modes of

working the propulsion system, namely (a) that in which the air is only heated before it reaches the wet screen, and (b) that in which it is heated after passing the screen or even before and after.

The observations at Provanside were kindly taken for me by the headmaster (Mr. Marshall) and his science master (Mr. Walter Jamieson, B.Sc.), and the janitor (Mr. Goodfellow). They consisted in taking the readings of various wet and dry bulb thermometers daily at 1 p.m. and 4 p.m. for eight days in these positions:—(1) Outside air. (2) Between heated pipes and screen. (3) In main duct inside fan. (4) In a class-room on the third floor (Mr. Jamieson's room). The mean of sixteen readings shows that with an average external temperature of 47.6 deg. F. and an average relative humidity of 70.1 per cent. the average temperature in the class-room was 56.2 deg. F. and the relative humidity 71.3 per cent. Thus the temperature was raised 8.6 deg. F. and the humidity of the external air maintained.

Compare this with a series of observations made in Dalmarnock Public School, Preston Street, Bridgeton, where there is a propulsion system but with much less spacious passages. On the day of observation the hot pipes between the screen and fan were not in use, but only the radiators at the foot of the shafts. The day was a cold, raw one, with some wind and some sunshine.

TABLE 1.

January 29th, 1909.		Dry.	Wet.	Relative	
		Deg. F.	Deg. F.	Humidity.	
11.20	Preston Street	48	43	67	} mean 70
	Do. (in wind)	46	42	73	
	In main duct between screen and fan (blow)	47	41	61	
	3rd Floor: Gallery	57	50	61	
	Room 12: radiator at foot of shaft in use	64	53	48	
	Room 17 Do.	64	53	48	
	Room 18: radiator off because of complaint of overheating	62	53	54	

In this case the mean external humidity, far from being maintained, is reduced 22 per cent., and that in spite of vapour exhaled by the children. Results in the same sense were obtained by similar observations.

But to exclude the error due to the humidity added by the children, it was decided to take the air as it entered at the inlet. In Provanside

there was a ledge on which the thermometer stood and was freely exposed to the incoming air. In Dalmarnock and Church Street (Partick) Schools the apparatus had to be held in position. The results are given in the table appended, and show the striking contrasts.

TABLE 2.

Positions.	PROVANSIDE.			DALMARNOCK.			CHURCH STREET.		
	Dry Bulb.	Wet Bulb.	Rel. Hum.	Dry Bulb.	Wet Bulb.	Rel. Hum.	Dry Bulb.	Wet Bulb.	Rel. Hum.
Play-ground	47°F	44°F	79%	48°F	42°F	62%	48°F	45°F	79%
Main Duct	59°	51°	57	47°	41°	61	67°	57°	52
Class-rm. Inlet	57°	50°	61	61°	46°	35	90°	65°	24.9

These observations show, and others taken at random have all been in the same sense, that in Provanside the temperature of the outer air is raised and the humidity well maintained, whereas in Dalmarnock and Church Street the temperature is raised but the humidity is much depressed. In Church Street the temperature is excessive, making the humidity extremely low at the inlet.

Similar results to those in Church Street were got at Hamilton Academy and at Garrioch Road Public School, Maryhill. In these cases the amount of air being delivered into the class-room was very small, little or no draught being felt at the inlet. This was confirmed by the outlet readings, which showed a drop of 10° to 20° and even 30°, showing that the amount injected was insufficient to raise the temperature of the air occupying the class-room to anything near its own temperature. As with a good propulsion system the air in a class-room is changed 6, 8, and 10 times per hour, the air in the class-room should almost maintain the temperature at which it is delivered into the room. In Provanside, throughout repeated testings, the inlet and outlet dry bulb temperatures were either equal or the inlet one was the lower. In the case of the wet bulb readings the inlet was always the lower, as was to be expected from the added moisture from the children raising the humidity and so lessening the evaporation from the wet bulb. In Provanside, in Room 10, an anemometer is fixed in the inlet opening, and is so arranged that it records on a dial in the headmaster's room the time in which a volume of air, sufficient to fill the class-rooms, passes it. On trial this time usually runs out at 6 to 8 minutes, depending on the speed of the fans. The air of the class-room is thus changed 10 to 7½ times per hour, which, with a cubic space of 140 cubic feet per child, means

that for each child 1,400 to 1,100 cubic feet of warmed and washed air is supplied per hour in addition to the 140 cubic feet of initial air space. With no other system can such an amount be supplied so imperceptibly and so cleanly when all is well; but from the observations detailed above the system can woefully fail by supplying excessively heated and dry air and in a deficient amount.

Let us now examine in some detail the points where the propulsion system, as usually installed, transgresses principles laid down by authoritative writers on the physics of ventilation.

In the first place, the system, as a whole, should be designed to supply a certain volume of air which should allow a liberal margin for unforeseen emergencies. The fan or fans should be proportioned to the work required, and should not need to be run at top speed for efficiency but have some reserve. The variations in reserve provided are well shown in the following table, where the flow produced by the fan is calculated from the formula $V = k a v$, where $k = 0.65$, a is the area of fan orifice in square feet, and v is two-thirds of the velocity of the tips of the fans, all taken as revolving at the rate of 220 per minute.

TABLE 3.

	Scholars.	Number of Fans.	Diameter.	Total Area.	Flow per hour $V = k a v$.	Apparent Cubic Feet per Child per hour.
Provanside	1,300	2	6.0	56.4	6,861,927	5,000
Church Street	1,300	1	7.5	44.0	6,701,100	5,000
Dalmarnock	1,300	1	5.5	23.7	2,636,235	2,000
Hamilton Academy	500	1	5.0	19.3	1,951,643	3,900

But more important considerations which have emerged in the course of this inquiry have been the ratios of inlet area to screen area and of both to fan area. If a fan is working in a short circular channel opening on both sides into spacious chambers, the amount of air which it can propel is calculable from formulæ as in Table 3. The efficiency of the fan in any plenum system is usually calculated on this basis, and on paper works out all right. In practice, however, the difficulty in most systems is to get a sufficiency of air, and this actually obtains in two of the schools mentioned, namely, Church Street (Partick) and Hamilton Academy. The same difficulty was present at first in Provanside

School in spite of two powerful fans, 6 ft. each in diameter, and with two inlets each 7 ft. by 6 ft., and each blocked by a screen of jute matting kept wet. When the screens were kept dry more air was got, but too dry. Latterly the screens were removed altogether, and then plenty of heated dry air was got. Lastly one large screen was erected in the chamber to which the inlets led and from which the fans sucked the air. In this position the problem was solved and plenty of air got even through a wet screen. The reason for all this is not far to seek. The ratio of fan area to inlet area in this case is 2 (πr^2) to 2 (7×6) where r is 3 ft. or 28.2 : 42. But the greater the flow induced by the fans the greater the velocity and the greater the friction or resistance, and these factors react on the flow in this way that for the same head or power produced by the fan the flow of air varies directly as the size of inlet area according to the formula,*

$$\frac{H}{V^2} = \frac{1}{27a} \quad \text{where } H \text{ is head in foot-pounds}$$

per lb. of air passed.

V the flow.

a is the area of fan inlet.

Thus the fan aspirates a certain volume of air from the heating chamber, and this induces a flow down the outer inlet. Here more resistance is experienced, owing to the fluid vein produced, and this can be ignored if the area is reduced by a constant which for any shape of orifice in a thin plate is 0.65. If we apply this to the inlet orifice given above it becomes $42 \times 0.65 = 27.3$ square feet, so that the ratio now becomes 28.2 : 27.3. The fan is therefore practically sucking the air through a tube of its own diameter. But when the inlet orifice was blocked by a screen of jute matting the air has to pass through a multitude of little holes, and the space is probably reduced to one-half, owing to the matting itself. Thus the above ratio would then become 28.2 : 13.6, so that the fan working at the same speed would only aspirate about half the volume of air. This explains the practical difficulty observed when the screen was in this position of obtaining sufficient air, and which disappeared when the screen was totally removed. When one large screen was placed in the intermediate chamber its area was and is now 201.5 square feet, and this reduced by one-half for the matting and by multiplication by 0.65 for friction gives 65.4 square feet for both inlets or 32.7 square feet for one inlet. The ratio of one fan orifice to share of screen is

thus 28.2 : 32.7. Thus there is sufficient inlet area after allowing for reduction of surface from matting and friction. Compare this with Church Street, Dalmarnock and Hamilton Academy, where a sufficiency of air cannot be got. The ratio of the fan orifice to inlet orifice and screen area (the three latter reduced for friction and the screen one half for matting) in the four schools is as follows:—

TABLE 4.

	Fan Orifice.	Inlet Orifice. X 0.65.	Inlet Fan X 100.	Screen Area. X 0.315.	Screen Fan X 100.
Provanside ...	56.4	54.6	96.8	65.4	115.9
Church St. ...	44.1	32.5	73.8	52.5	118.7
Hamilton Ac. ...	19.64	5.85	29.7	37.05	188.6
Dalmarnock ...	23.77	9.1	38.2	17.55	73.8

P.S.—The inlet orifices at Hamilton Academy and Dalmarnock are taken as in use, but these can be and have been enlarged.

This table shows that at Provanside the flow induced by the fan will be reduced about 3.2 per cent. by the size of inlet area, and at Church Street 26.2 per cent.; at Hamilton Academy 70.3 per cent.; and at Dalmarnock 61.8 per cent.

Combining the two tables, by applying the rule given above, that for the same head or power the flow varies directly as the size of inlet area, we get the following results:—

TABLE 5.

	Apparent flow per hour per pupil.	Inlet Fan X 100.	Flow Reduced from this cause to
Provanside ...	5,000	96.8	4,840
Church St. ...	5,000	73.8	3,690
Hamilton Ac.	3,900	29.7	1,489
Dalmarnock.	2,000	38.2	594

This shows how seriously the efficiency of the fan can be impaired by small inlets. There is a further diminution of the flow from the power lost in the ventilated space and in overcoming the resistance of the outlets; but also in the resistance encountered at the small air-shafts leading from the main ducts to the class-room. These are usually provided with a shutter below, which can be opened as required. There is also a radiator which helps to lessen the space. Now in Table 5 the amount of air apparently supplied per scholar at Church

Street and Provanside is not much different, and yet in the class-rooms the difference is very notable. This is probably due to the fact that at Church Street the shutters are many of them almost closed and some less so, so that only a small chink is left. The inlet area to a room is thus reduced from about 48 in. by 36 in. to about 6 in. by 36 in., and so a great obstruction is offered to the passage of the large volume of air sent on by the fan. If the whole 3,690 cubic feet per scholar would pass up with a 48 in. by 36 in. opening, then only $\frac{6}{48}$ or $\frac{1}{8}$ th will pass up with the 6 in. by 36 in. opening. The fan is therefore rendered much less powerful. Of course, owing to friction, etc., only about 1,200 cubic feet will enter the class-room with the full inlet area, so that at Church Street with a powerful fan only one-eighth of this or 150 cubic feet is obtained. The reason why these inlets are not opened underneath is that owing to various causes not yet clearly elucidated other things go wrong when more air is got. The air is too dry or too hot or both, or too humid. This is an argument for an examination of the system by some competent person with experimental powers.

The screen should not exactly fit the inlet or inlets, because in that case the volume of air being sucked in by the fan or fans encounters great resistance, owing to the screen being in reality a multitude of little holes, whose total surface area is probably less than half that of the inlet. The head or pressure of air is thus much reduced, and the mechanical energy of the fan is greatly lost in overcoming the friction. The screen should equal at least twice the size of the least inlet area. But when the screen is of the least inlet area. But when the screen is wet the friction is greater and so a larger screen even than twice the inlet area is needed. At Provanside the two inlets, each 6 ft. by 7 ft., were blocked by a screen, and the two powerful fans were unable to aspirate a sufficiency of air through. When the screen was kept dry more air was got through, but, of course, very dry. Later the screens were removed, and a single one erected inside the first pair of stacks of heating pipes, when plenty of air was got. In this position it acts well, and on actual measurement is 27½ ft. by 7½ ft. less a door 6 ft. by 2½ ft., or 201.5 sq. ft. in area. The inlets are 2 ft. by 6 ft. by 7 ft., or 84 sq. ft. and the ratio is therefore 84 : 201.5, or 1 : 2.4.

The screen is usually looked upon as a washing agent, but its more important function is to humidify the air passing through it. Certainly the washing function is of value, and

especially in towns, but when schools not having a propulsion system can do without air washing, the schools having this system could manage without it too. It is, I believe, the emphasis laid on the part played by the screen in washing the air which has led to the neglect of its important action in humidifying it. And yet the two go hand in hand.

In the article "Ventilation" in Stevenson and Murphy's Treatise on Hygiene, vol. i., p. 51, the writer, W. N. Shaw, Esq., F.R.S., Director of the Meteorological Office, makes the following statement:—

"A filter of any sort is more effective if it is colder than the air passing through it; so that it would be well to interpose the filter in such a position that the air passes through it after being warmed."

The same statement would hold good if the word "humidifier" were put in place of "filter."

Now the screen in the propulsion system is a filter and humidifier, and yet in most cases the air is presented to it at almost the same temperature as that of the screen. This would not be of much importance if the air did not require to be heated afterwards, but it is of extreme importance where that has to be done to any considerable extent. When we consider that for three months of the year in Scotland the mean temperature is under 40 deg. F. and that the mean of all the maximum temperatures is under 50 deg. for six months of the year, the necessity for heating any large volume of air propelled into a class-room is at once apparent. The temperature of the air delivered should be 56 deg. to 60 deg. F. and the relative humidity 60 per cent. to 70 per cent. and not less than 55 per cent. In the usual plenum installation the air at 40 deg. to 50 deg. F. first meets the wet screen, is washed and humidified, and then heated to 50 deg. to 80 deg. or 90 deg. F. (It is true some attempt at further humidification is tried by using a spray, but this futile effort we shall consider afterwards.) The result is that very dry air is delivered to the class-rooms, and is so uncomfortable as to lead to disuse of the system or to the opening of windows or to the opening of the roof shutter on the outlet and so short-circuiting the system. In Church Street, Partick, the air entering one class-room (No. 6) had a relative humidity of 18.6 per cent. and a temperature of 91 deg. F. In Hamilton Academy the air entering Room 1 had a relative humidity of 33 per cent. and a temperature of 80 deg. F., and in Dalmarnock School the air entering Room 12 had a relative humidity of

* Stevenson & Murphy. Vol. I., page 53.

35 per cent. and a temperature of 61 deg. F. In the first two instances only a small volume of air was being propelled in, and in the last quite a large volume.

Now when we consider the matter the explanation is simple. The comfort or discomfort experienced by exposure to warm air is due not to the absolute amount of moisture it contains but to the relative amount of what it actually contains to what it could contain. The capacity of a cubic foot of air for moisture increases with the temperature. Thus air at 41°F. is saturated by three grains of aqueous vapour per cubic foot of air. If it contains two grains the relative humidity would be $\frac{2}{3} \times 100$ or 66 per cent., and the air would be cold but pleasant.

If such air is sucked down the inlet of a propulsion system it is first brought into contact with a screen wet with cold water of much the same temperature. Little evaporation takes place because the entering air is fairly well saturated with moisture, and because the latent heat to evaporate a constant amount of water to add another grain of moisture to each cubic foot of air is not forthcoming. Let us, however, suppose the air does pick up so much moisture that it becomes saturated at 41 deg. F. It then passes over stacks of hot pipes and through the fan, and let us suppose it is, for convenience of argument, at what is a fairly suitable temperature for delivery to the class-rooms, namely 61 deg. F. Now at 61 deg. F. one cubic foot of air has a capacity for six grains of moisture, so that the air at 41 deg. F. and containing three grains of moisture per cubic foot, and having a relative humidity of 100 per cent., has now become air at 61 deg. F. with rather less than three grains of moisture per cubic foot, owing to the expansion of the air and a relative humidity of $\frac{3}{6} \times 100$ or 50 per cent. If, as often happens, the delivery of air to any one class-room is small and so the room is not even heated, let alone ventilated, the radiator at the foot of the class-room shaft is asked to be put on and then the air is delivered (as was the case at Hamilton Academy and Church Street School, Partick) at 80 deg. F. and 91 deg. F. In these cases the air saturated at 41 deg. F. becomes expanded considerably, but even ignoring the loss of vapour per cubic foot due to this, the relative humidity becomes reduced at 80 deg. F. to $\frac{3}{11} \times 100$ or 27.2 per cent. and at 91 deg. F. to $\frac{3}{18.3} \times 100$ or 19.6 per cent.

It is therefore obvious that the entering air

should first be warmed and then meet the screen when it will be able to carry away sufficient moisture to produce a relative humidity of 60 per cent. to 70 per cent. at the temperature of delivery to the class-rooms. To ascertain the degree of heating required, some observations were made at Provanside, but owing to the close packing of the parts of the system no proper mixing of the air after being warmed takes place before it reaches the screen. The result is that the thermometer gave different readings according as air direct from the hot pipes comes in contact with it or air passing between the coils. Radiation from the coils also tended to impair the results. The highest reading was 70 deg. F., and the lowest 52 deg. F. But if sufficient heat is imparted to the air before it meets the screen, and no further heat is applied and sufficient volume of air is being supplied to each class-room, the readings inside the fan and the main duct should be between 56 deg. F. and 60 deg. F. for the dry bulb, and 49 deg. F. to 52.5 deg. F. for the wet bulb. The difference between the readings of the dry bulb and the wet bulb should not exceed 8 deg. F. for the temperatures given, nor be less than 5 deg. F. Under such circumstances the humidity will not fall lower than 56 per cent. nor rise higher than 71 per cent. Of course, in the latter case the humidity due to the scholars might increase the total humidity to the extent of 10 per cent. That is why an average humidity of 60 per cent. at the inlet should be aimed at, and that is given by the following readings:—

TABLE 6.

Dry Bulb. Deg. F.		Wet Bulb. Deg. F.		Relative Humidity. Per cent.
60	...	52.5	...	60
59	...	52	...	61
58	...	51	...	61
57	...	50	...	61
56	...	49	...	60

To overcome the dryness of the air in the main duct a spray or sprays of water have been introduced there. Such is found in Church Street, Garrioch Road, etc. Inasmuch as these do not act automatically as the screen does in wetting the air according to its dryness or wetness, but have to be turned off and on by the supervisor, they are liable to be used erratically. Apart from that, they are inefficient, because in some schools where they are used the air is afterwards heated by the radiators at the foot of the class-room shaft, and so dried again. This is the state of affairs in Church Street and Garrioch Road Schools.

But, further, the amount of water sprayed is usually inadequate. Thus in Church Street, according to Table 3, the flow per hour is apparently 6,700,000 cubic feet. This volume of air, according to our previous calculation, if passing through the screen at 41 deg. F. without previous heating, would have from 2 to 3 grains of moisture per cubic foot. If heated (as was found on observation) to 61 deg. F. before passing through the fan, it would have then a relative humidity of

$$\frac{2 \text{ or } 3}{6} \times 100 \text{ or } 33 \text{ per cent. to } 50 \text{ per cent.}$$

It would then meet the spray which is seldom on full, and would require at least one grain per cubic foot of moisture added to it, bringing the relative humidity up to 50 to 60 per cent. This would mean 6,700,000 grains of water per hour or 95.7, say, 96 gallons per hour. Now this is a minimum and obtained with the spray on full, and with a low external humidity on a cold day and much more would be required. On actual measurement, with the spray full on, it was found to discharge one gallon in five minutes or twelve gallons per hour, or one-eighth of the quantity required by the above calculation. However, as only about one-quarter of the apparent flow is delivered to the class-rooms in Provanside, if we apply this to Church Street, the spray on full is not deficient to the extent of one-eighth, but to that of one-half. In Church Street in addition, even this volume of air is not delivered, probably only one-half to one-quarter of it, owing to the obstruction produced by the inlets being closed as much as possible. This makes the spray too efficient there and probably explains why the air delivered to the class-rooms was too humid when the radiators at the foot of the air-shafts were put out of use. The small volume of air was over-humidified, by the spray, and not being heated thereafter was so delivered to the class-rooms. This illustrates one of the dangers of an efficient spray, namely, over-humidification.

In regard to the heating of the air, the size of the pipes is a matter of importance.

In Provanside these are 1½-in. steam-heated pipes with similar small interspaces so that the air is much more in contact and more easily heated before reaching the screen than where, as in Church Street and Dalmarnock and elsewhere the piping is 1½ in. to 4 in. in diameter and arranged in rows 6 in. to 12 in. between each.

The danger of over-humidification would become a more real one if the heating of the air took place first as here advised, just as at

present the main failure of the system is expressed by the word under-humidification. However, in the case of over-humidification the remedy lies in supplying the supervisor with a wet and dry bulb thermometer and instructing him in the use of it. If the temperatures already given in Table 6 are adhered to, then little complaint can be made on this score. Of course, if a small volume of air even properly humidified is injected into a colder room the injected air will be cooled and rendered over-moist. The remedy for this lies in adjusting the supply of air to each class-room so that the temperature of the room is maintained at that of the injected air, say 58 deg. F., and then no such faults will arise.

The position of the inlets and outlets, relatively to the windows and the short and long walls of the class-room and to each other, are points which are worthy of attention and which I hope to return to, with others not alluded to, on a subsequent occasion. The observations recorded here have been made as a preliminary account in the hope that they may be of value in the rectification of some installations already made and in the avoidance of some pitfalls in any new system.

No opinion is expressed as to the value of the system compared with others, because that would involve a wider discussion than is here called for. Once the plenum system is working efficiently then will be the time to discuss its relative advantages.

SUMMARY.—The following are the deductions which fall to be made from the foregoing observations:—

1. The fan should be of ample power and should exhaust from the open air, or from a large chamber.
2. The inlet to this chamber should be at least twice the area of fan opening.
3. The screen should be placed across the chamber and in area should be at least four times the area of fan opening.
4. The heating of the air should be accomplished between the inlet and the screen, and should preferably be by 1½-in. steam-heated pipes arranged closely together.
5. A wet and dry bulb thermometer should be hung inside the fan and screen, and should on the average register 58 deg. F. on the dry bulb and 51 deg. F. on the wet bulb.
6. The heating of the air and wetting of the screen should be regulated to secure this.
7. No spray should be used in the ducts.

8. The radiators at the foot of the air shafts should not be used.

9. The shutters over the foot of the inlets to the class-rooms should be regulated so that each room is getting its fair share of air.

10. The system requires a considerable expenditure of time and thought to get it adjusted to all the various needs.

In conclusion, I beg to thank the gentlemen already named for advice and friendly discussion, and for facilities offered; and in addition for similar reasons the following gentlemen: William Purdie, Esq., Headmaster Church Street, Public School; William Macintyre, Esq., F.E.I.S., Headmaster Dalmarnock Public School, Glasgow; D. M. Andrew, Esq., M.A., Rector, Hamilton Academy; John Middleton, Esq., B.Sc., science master, Hamilton Academy; and Alexander Ross, Esq., F.E.I.S., Headmaster Garrioch Road Public School, Maryhill.

CHILDHOOD'S UNHEALTHY PLEASURES.—Septic sore throat, diphtheria and many undefined illnesses, are probably the consequence of the dangerous habits of young children who manifest such a strong predilection for putting every kind of article, clean or otherwise into their mouths. Children seem highly delighted when searching for odds and ends among the refuse contained in the dustbins. Groups of children, just under school age, may often be seen waiting with anxious care, a scavenger bringing up the contents of a street cesspool, and if he has been successful in keeping them off during the (judging from their faces) intensely interesting operation, no sooner is he gone than they start to eagerly grope among the sludge, searching for lost treasures.—*Annual Report of Dr. W. G. Stevens, Medical Officer of Health, Renfrew.*

COMPLIMENTARY DINNER TO DR. TATHAM.—Dr. Hamer and Dr. Herbert-Jones have asked us to announce that it is considered that the occasion of the retirement of Dr. J. F. W. Tatham from the position of Superintendent of Statistics in the General Register Office affords a fitting opportunity to his friends to show their appreciation of his services to public health by entertaining him at a dinner which it has been arranged to hold at the Grand Hotel, Charing Cross, on Thursday, June 17th, at 8 p.m. Sir Shirley Murphy has consented to preside, and a number of those who are associated with public health work have already intimated their intention to be present. Any of Dr. Tatham's friends who have not already communicated with Dr. Hamer are requested to kindly send their names to him at 55, Dartmouth Park Hill, N.W. Dinner tickets, one guinea, inclusive of wine.

THE RELATIONSHIP OF OCCUPATION TO DISEASE.

By W. F. DEARDEN, M.R.C.S., L.R.C.P., D.P.H.,
Medical Officer of Health, Port of Manchester.

THE origin of "Industrial Disease" was synonymous with the introduction of associated labour, and its history is the history of the great industrial revolution brought about by the subordinating of mechanical power to the needs of man. The fate of ancient methods of manufacture was sealed in the year 1769, when two historical patents were registered at the British Patent Office. I need scarcely state that these had reference to James Watt's condensing engine and Richard Arkwright's spinning frame, which, though not the first results of efforts made in the direction of utilising steam for the production of mechanical power or to find a method of spinning by machinery, were the first practical outcome in each case. The two were not at once associated, the pioneer cotton mill, built at Nottingham, being worked by horse power produced by actual horses, and the subsequent ones, dating from that erected at Cromford, in Derbyshire, by water-wheel. Indeed, Arkwright's machine was generally known, during the early days of its career, as the "water-frame." But two such powerful factors in this commencing world-wide revolution could not be kept apart for long; they soon went into double harness and inaugurated our great factory system, which was thus thrust upon our forefathers and brought so much of good and evil in its train.

The early textile industry had for its *habitat* what we should term the domestic workshop, and this could be run equally well in the country homestead, village, or market town; indeed it is well known to all of you that our earliest cotton-cloth manufacturers sprung up from the small farmers of East Lancashire. The new conditions meant the association of labour in special buildings designed for production in bulk and at a greater rate, the erection of these buildings in the most central situations for trade purposes, and the gradual concentration of a working class population round these centres.

This migration into towns, though only indirectly affecting the subject of this paper, cannot be passed over without some brief notice of the serious social as well as industrial problem which it created and of the

remarkable influence thus brought to bear upon the health, physique and morals of future generations. There were no Public Health Acts or any sanitary service to regulate the overcrowding which thus had its beginning, and there were no Cadburys or Levers to foresee the advantages to be gained by housing the workers under healthy conditions. The result was a legacy which has had to be taken up by our modern Public Health authorities, and which has involved a cost to the public purse of many millions in carrying out schemes for the sole object of undoing a condition of things which our inconsiderate progenitors had passively allowed to come into existence. Looking upon the worker as an industrial unit, and nothing further, we can readily appreciate the evil influence which can be exercised by insanitary habitation and its usual accompaniments. Fresh air, healthy recreation, cleanliness, good food and a proper degree of rest are essential factors in regenerating the capabilities of the worker in the intervals between toil, and when, either through want of opportunity or personal neglect, these are unavailable, the body suffers. We can never afford to disregard this "outside influence" in the study of Industrial Disease.

I must, however, be satisfied in thus noticing the direction in which outside conditions are associated with susceptibility, severity and extent of occupational ailments, and proceed to the consideration of the general and particular influences exercised by industrial processes themselves upon the human economy.

The recognition of the evil influence upon bodily health, development, and morals of the conditions under which associated labour was carried on has from time to time been the means of producing our various Factory Acts, and the history of the several movements culminating in these gives the history of advance of knowledge in industrial diseases and the various measures of prevention recommended and adopted. It is true that legislation has been "piecemeal;" but as the factory system has hitherto been of progressive development, I do not well see how it could have been otherwise. When old processes are continually on the improve and new ones being devised different conditions are brought about, with many providing their own particular dangers or risks. As a vivid example, I might instance the fact that the trade dangers regarded as necessitating the scheduling of a number of industrial processes under the

Workmen's Compensation Act of 1906, as qualifying those injured thereby for compensation, were non-existent a century ago, and that, furthermore, since the Act came into operation this schedule has been added to on two occasions. It should therefore prove of some interest to briefly trace this development of special knowledge along the line of factory legislation.

The first Factory Act, which was passed in 1802, was known as the "Factory Health and Morals Act," and was distinctly an Act with a purpose, being directly aimed at mitigating the disgraceful conditions under which juvenile labour was utilised in those early days. These youngsters were employed under the old system of apprenticeship, and were thus taken under the full charge of their employers, who were responsible for their board, lodging, and proper bringing up. The way they were herded together was particularly conducive to the spread of vice, immorality, and disease. Parents, very naturally, would not put their own children to work under such conditions, so that the required number for a factory had to be made up by pauper children, who were collected by a species of slave-dealer from all parts of the country. These were cruelly thrashed if they were caught in an attempt to run away, and were frequently degraded by being compelled to wear leg-irons; it is even on record that a batch were once put up by auction as part of a bankrupt stock. The Act enforced cleanliness and ventilation, ordering whitewashing of the premises twice each year, and the provision of a sufficient number of windows and openings for air. The hours of labour were limited to twelve, and a certain amount of elementary education and religious instruction made compulsory. Each premises had to be periodically visited by a magistrate and a clergyman. Occupiers were also directed to call in the aid of a medical man whenever infectious disease became prevalent, with the object of his "ascertaining the nature and probable effects of such disease, and for applying such remedies and recommending such regulations as he shall think proper," it being, at the same time, his duty to forward a report direct to the official visitors.

It can thus be seen that the earliest endeavour to control the unsavoury conditions under which associated labour was carried on established the great fundamental principles upon which practically all subsequent factory legislation has been built up, viz., the purification

of the atmosphere of workrooms, cleanliness, regulation of working hours, State control of juvenile labour and education, and the establishment of medical and lay supervision. The trend of each successive Act has been to elaborate on these principles as necessity has arisen and knowledge grown, and to extend their protective influence over other than the textile industries. The Act of 1833 further limited the hours for juvenile employment and fixed the minimum age for working half-time and full-time at nine and thirteen respectively. Medical supervision was further extended by the requirement of a medical certificate for each child or young person, attesting that he or she was of the ordinary strength and appearance of the age specified. These medical examinations were placed in the hands of duly appointed certifying surgeons by the Act of 1844, the certificate became one of health and fitness as well as of age, and the age period for this requirement was raised to sixteen. The investigation into the causation of accidents was another obligation placed upon the certifying surgeon. A universal ten hours work day was established by the Ten Hours Act of 1847, women and juveniles not being allowed to work more. As associated industries grew in importance and extent they were brought under the control of the Factory Department. Commencing with print works, dye works, bleach works and lace factories, the list has been so added to that now every manufacturing process in the country has been brought into line, and even bakehouses and laundries have now been successfully gathered in. The importance of responsible medical supervision has been particularly emphasised in later years. The Act of 1891 empowered the Secretary of State to make "special rules" to regulate dangerous trades or processes, and in these medical examinations, periodic and otherwise, are a pronounced feature. The Act of 1895 directed the certifying surgeon to investigate reportable cases of industrial poisoning and disease, and gave to the Home Secretary power to add any industrial disease to the list. The Act of 1901 gave the certifying surgeon power to qualify his certificates of fitness by conditions, and the "dressmakers' order," which came into force in 1907, extended the certificate of fitness requirement to a large number of workshops. The list is completed by the Compensation Act of 1906, which requires the certifying surgeon to examine workpeople claiming compensation for industrial

poisoning or disease. I must, however, not omit to mention that there are now attached to the Home Office two Medical Inspectors of Factories, who exercise a general supervising function over the work of the district surgeons.

After this rapid *résumé* of a century's progress, it is worth while drawing attention to the present day position of Industrial Hygiene as a recognised branch of medical research and study. In this country it has been prominently brought before the profession by the action of the British Medical Association in devoting a special section at recent annual meetings to the consideration of its problems, as well as by the valuable work and publications of Sir Thomas Oliver, Dr. T. M. Legge, the late Dr. Arlidge, and a number of others that might be mentioned. On the Continent the importance of the subject is well recognised, and particularly in Germany definite courses of instruction have been arranged to meet the demand for knowledge in this direction. Recently an International Committee for the study and spread of knowledge of Industrial Disease has been established, the headquarters being fixed at Milan. Personally I am of opinion that the time has arrived for providing facilities for study of this branch of medicine at our own medical schools, and I am pleased to note that Sheffield University intends establishing a "chair" or lectureship to this end. The necessity of thoroughly understanding the principles of Industrial Medicine for purposes of prevention may, I believe, be said to be sufficiently pronounced, so far as concerns the Certifying Surgeon; but I think I am correct in pointing out that the recognition by the State of the right to compensation of those injured in health by dangerous processes makes it equally incumbent upon those medical practitioners administering to the needs of an industrial community to know something of the effects of these processes.

I think now I may briefly summarise the ways in which the chief conditions influencing the health of factory workers make themselves felt upon the human economy.

HOURS OF LABOUR.

The continuous exercise of bodily function, whether muscular or mental, which is necessitated in the course of daily labour, has its natural result in the feeling of fatigue. This is, of course, quite normal with everyone, and is simply an indication that the particular function should be suspended until the

elementary factors concerned have had opportunity to recharge themselves with energy-producing materials, and have thrown off their waste products. The ideal point, therefore, to aim at, in assessing the correct time one should be allowed to work to show the best results, is to establish an exact co-relation between the hours of labour, rest, and that other important factor, recreation. Physiologically it is known that the waste products from muscular exertion so affect the nerves and organs in the muscles themselves as to render them unresponsive to their usual stimuli, and, at the same time, inhibit the activity of the cells of the grey matter in the brain, causing them to be less receptive of sensory impulses and less able to emit volitional efforts. The existence of a fatigue-producing toxin has been proved, as has also its equivalent anti-toxin, and an explanation been provided, on these grounds, for the ability possessed by the properly trained to sustain prolonged effort. The abuse of these physiological principles must therefore inevitably lead to impairment or even loss of a particular function, as well as to general debilitation. The modern high-speed machinery requires a great concentration of mental as well as bodily effort, and the effect of the resultant fatigue is shown in the proneness to accident from cerebral weariness, and the susceptibility to cold and other external impressions from the general debilitating influence. The effect of this concentration of mind for long periods has been well illustrated by my friend Dr. Alex. Scott, of Glasgow, in his descriptions of the results noticed in drivers of long distance express trains and the apparent inability of electric car drivers to obviate catastrophes by doing the right thing at the psychological moment. My personal experience has provided me with at least one typical case where a patient temporarily lost his mental balance through his energies, year in and year out, being directed along one solitary groove, and I have frequently been told by experienced managers that the tendency to "have a week on the club" for trivial causes is really due to the want of a rest, and that when the man returns he sets about his work in a totally different manner to beforetime. We know that the increase of speed means not only an increase in power but an alteration in the ratio of power to speed; for instance, a double coal consumption will not double the rate of travelling of an ocean liner. Is it not the same with the human machine which has

to keep pace with the iron one? Does not this increase of production by speeding up mean not only a progressive demand on mechanical energy, but an equally progressive strain upon the human economy? Still another query. Is it not natural to suppose that the inevitable outcome of these advanced conditions of factory work will be a demand for the restoration of equilibrium by the only logical course, *i.e.*, a reduction in the working hours?

Turning to the results of prolonged muscular effort, we get such loss of function as "telegraphists' cramp," the effects upon the heart and circulation of increased blood pressure, and the damage to excretory organs from excess of effete matter requiring expulsion.

The influence of long hours and muscular strain upon women and children was recognised in the early days of factory legislation, and is still receiving attention from those interested in the future of our race. The stunted, deformed bodies of fifty years ago and the frequency of Cæsarean section as the result of the twisted pelvis inflicted upon our Lancashire working classes of that time are luckily past evidence of the evil, and it is now very rarely that one comes across rickets in a half-timer or young person. This matter of "strain," however, is still a consideration of deep moment to the certifying surgeon, and the conditions with which he qualifies his certificate are very frequently aimed at preventing ill-effects from this cause. It is rather a sad reflection upon our advanced knowledge of to-day that there has been no satisfactory attempt made to regulate the employment of women during child-bearing and child-rearing periods. We have plenty of evidence of the effect of bringing up babies by hand from the first month onwards, and it should not require a too vivid imagination to gauge the influence of the "strenuous" working life on the nutrition of the child unborn.

Apart from the general influence of long hours, I must just note that in certain processes, such as caisson work and vulcanising by carbon bi-sulphide, it is necessary to specially restrict the working to obviate the now well-known ill results.

In leaving this part of my subject, I would like to throw out a suggestion which I have hinted at earlier on, and which I think should form a good basis for discussion. Recognising the increased stress upon the individual of modern methods, and the necessity for a correct proportion of rest, as well as of opportunities for the development of the functions of mind and

body in other directions than those prescribed by the narrow limits of daily occupation, as a means of providing against premature break-down, would it not be wise, as a general principle, to advocate the division of the twenty-four hours' day into its three even proportions: one part to be devoted to labour, one to rest, and the other to recreation? I know several firms who have adopted their share of the principle with what they consider excellent results, not only so far as concerns the well-being of the workers, but also in the direction of extent and quality of production.

CLEANLINESS.

The Factory Act makes provision for cleanliness of the workroom by periodical white-washing, painting or cleansing of paintwork, and, with our present-day knowledge of the facilities afforded by dirty walls and floors for the propagation of septic and disease-creating bacteria, we can fully appreciate the influence for good of this insistence. With the exception, however, of certain washing of hands in dangerous processes, we make no provision for clean bodies. It appears to have been recognised to a considerable extent among our continental neighbours that it is an advantage to the worker to have facilities for changing his clothes when commencing and leaving work, and to have opportunity and means for a good wash when utilising the latter privilege. We have certainly something to learn from our contemporaries. A youth who had the misfortune to have his arm caught in a machine explained to me that this was due to the fact that, being Monday morning, he had a clean shirt on, which accounted for the sleeve becoming unrolled soon after starting work. He further added that at the end of the week such a thing would be impossible, on account of the roll being firmly fixed in position, presumably from the frequent pawing with dirty, greasy, and sticky hands during his daily labours. The British youth is trained to "clear out quick" at the sound of the whistle; on goes his coat without consideration for such an unnecessary detail as turning down his shirt sleeves—the roll can be more economically left to come out in the wash. This incident is quite typical, and there is no doubt that if we regard it as essential that the working man as a State asset should be universally clean, there is nothing short of an amendment of the Factory Act that will accomplish the reform. I should have little difficulty in multiplying examples of the importance of personal cleanliness, but will be

content to mention the well-established and telling fact that the difference in incidence of cancer among English and Continental chimney-sweeps is due to their opposite habits in the matter of changing their working clothes.

Although he has not much control over the keeping of them clean, the certifying surgeon can regulate the younger end in this direction at the preliminary examination, and it is pleasing to note that a recent correspondent in the *British Medical Journal* has been firm enough to refuse 400 applicants during 1908 on account of the presence of nits and pediculi.

The provision of a sufficient amount of daylight is such an important factor as a regulator of cleanliness of the workroom that I cannot well pass the want of notice of this important accessory in legislative enactments. It has a well-recognised inhibitive influence on development of bacteria, and, in addition, is a potent factor in the bringing into prominence of dirty corners. The promoters of the next Factory Bill may take this as something worthy of their consideration.

RESPIRATORY IMPURITIES.

Under this heading I purpose dealing with the ill-effects of the products of respiration and gas combustion as a consequence of overcrowding and improper ventilation. The question of temperature and humidity is, of course, a very important side issue of this phase of the question.

Although there is a general provision that all workplaces must be kept at a proper temperature and efficiently ventilated, with a proviso that the Secretary of State may establish standards if he thinks fit, the only places where temperature, humidity and ventilation are definitely regulated are "cotton cloth and other humid factories." The humidity is governed by temperature according to fixed scale; the temperature must not exceed 70° F., and the respiratory impurity must not exceed, in equivalent, more than 9 volumes of CO₂ per 10,000 of air. Weaving sheds are one-storeyed structures with half glass roofs and flagged or concreted floors, and are therefore very susceptible to weather influences; but in spite of these natural impediments to success, most gratifying results have followed the enforcement of the regulations. Necessity proved a potent factor in devising means to accomplish the required improvements, however adverse the circumstances, and the incidence of colds, catarrh, rheumatism

and chest diseases became very soon materially reduced.

Mr. Balfour's Government appeared to be genuinely desirous of establishing a universal standard of ventilation for all factories and workshops, and appointed a committee to investigate and make recommendations. As the embodiment in law of the recommendations made would, in the opinion of a consensus of public health experts, have meant the official sanction of the very state of things which required improvement, as well as relaxing the beneficial restrictions in cotton-cloth factories, and as they were really incomplete, nothing came of this very praiseworthy attempt of a sympathetic Home Secretary. So far as my own view is concerned, I am satisfied that an equitable standard could be both fixed and enforced, and as to the real necessity for moving in the matter there should be no two opinions.

As regards air space, the Factory Act specifies a minimum amount of 250 cubic feet per person during ordinary working hours and 400 during overtime, and the Home Secretary can order more wherever he should think it necessary. An individual is entitled to a little more consideration in barracks, or even in prison, so that we may regard it as fortunate for factory hands that most employers have higher ideals on the subject of minimum cubic space than the Act requires.

Carbonic acid is not generally regarded as harmful, *per se*, but has been taken as indicating the presence of a proportionate quantity of organic waste products of respiration in the atmosphere. I have no doubt of the ill-effects which can be produced by an overdose of this organic matter. Some years ago I gave a lecture to 800 "toilers" in a very low, ill-ventilated room, with the result that a friend who accompanied me was laid up for several days afterwards with symptoms of toxæmia akin to what is commonly known as ptomaine poisoning. I am, however, not quite so convinced of the harmlessness of excessive quantities of carbonic acid when present in the air of workrooms. The increase in the tension of carbonic acid in the atmosphere breathed prevents the normal escape of this gas from the blood circulating through the lungs, the process of oxygenation being also interfered with through a lowering in the tension of atmospheric oxygen on account of the inroad made into the supply for this very purpose. Carbonic acid exercises a harmful

effect on both nervous and muscular tissue, so that the abnormal presence of this in the blood, combined with the usual products of muscle activity and a deficiency in oxygen, must tell a serious tale on the bodily energies, and at least render more pronounced that feeling of tiredness I have previously referred to.

It is obviously the smaller factories and workshops, which do not provide more than the legal limit of air space, where the mischief is done and where remedy is most required. The subject, however, may be safely relegated as another point worthy of consideration by our hereditary and elective legislators.

DUSTY PROCESSES.

The creation of dust by mechanical and other processes is one of the greatest troubles that the factory worker has to contend against, and one most prolific in its ill-effects. Its action upon the system may be either irritative, caustic or toxic. In bronzing processes, for example, we get irritation of the skin, mucous membranes and conjunctiva; from handling white arsenic I have seen severe ulcerations; we get chimney-sweeps' cancer from soot. The most serious irritating effect of dusty processes is, however, associated with the lungs and respiratory passages. The most pronounced and extensive toxic results of dust are, of course, brought about by lead processes.

The action of irritative dust on the lungs produces what is termed pneumokoniosis, a low kind of inflammation commencing in the alveoli and resulting in the formation in the lung tissue of a dense fibroid mass. The protective ciliated epithelium lining the respiratory passages becomes gradually worn away by repeated catarrhs, and when this stage is reached the barrier against absorption of the offending particles is removed, and the disease advances with greater rapidity. A theory has been advanced by Calmette that the main portal of entry of dust is through the digestive system, and he advances fairly good proof of his contention, but I think we may take it that, though this method of infection does occur, the principal source is direct. The effect of this lowering of the vitality and resisting power of the lung tissue is shown in the readiness with which tubercle bacilli can establish themselves and produce their particular lesions, death as a rule resulting from tubercular phthisis as a complication.

Pneumokonioses may arise from inorganic or organic dust, well-marked examples of the former being stone-masons' phthisis, potters'

rot and steel-grinders' phthisis, and of the latter the chest affections associated with the dusty processes in cotton, linen and "shoddy" trades.

Toxic symptoms arise from dust produced in the working of certain woods: in ruler making from maracaibo wood and in shuttle making from West African box-wood; but, as previously stated, lead dust is the most prolific in ill-results. The heading of yarn dyed with chromate of lead, the cutting of files on a leaden bed, the handling of metal type, the smoothing down of lead paint in coachmaking, etc., glass polishing and diamond cutting, white and red lead manufacture, the polishing of glazed earthenware, electric accumulator making, are all examples of dusty processes in which this metal or its compounds are utilized. The danger from absorption of lead dust is, of course, not in any way confined to the lungs, the main portal is the digestive tract. It has been distinctly proved, as the result of the institution of special rules, combined with periodical medical examinations, that personal cleanliness has been a potent factor in reducing the ill-effects; and the methods of clearing the dust by mechanical ventilation prevent absorption by either channel.

NOXIOUS GASES OR FUMES.

In a large number of special processes gases are given off which produce symptoms of poisoning of various degrees. We have carbon monoxide given off during the manufacture of illuminating gas, from blast furnaces when iron smelting, and rather commonly, in later days, from the escape of water-gas; sulphuretted hydrogen gas is evolved in certain chemical processes, and I have had several cases in my own experience in connection with the manufacture of coal-tar dyes. Bi-sulphide of carbon is extensively used for the vulcanizing of indiarubber, and its ill-effects have been the cause of the application of special rules; di-nitro-benzol affects workers in the manufacture of explosives; anilin exhibits its toxic effects during process of manufacture and in fast black dyeing processes; arsenuretted hydrogen poisoning has been met with in copper works during the removal of vitriol solution from tanks, and we have recently had experience of it in connection with ferro-silicon; nitrous fumes are given off in various processes with well-marked ill-effects; phosphorus fumes produce necrosis of the jaw. Poisoning from many of these gases occurs as the result of accident, but in others it occurs as an ordinary effect of

working at the process itself. In efforts at prevention the object has been to so regulate the processes as to keep the gas within a closed space, and to remove it away from the worker by extraction fans, as well as the shortening of hours at the particular work. Most of these poisonings come under the operation of special rules, and qualify for compensation under the recent Act.

OTHER INFLUENCES.

Hatters, furriers, makers of thermometers, barometers, electrical meters, electro gilders, and manufacturing chemists are subject to the risk of mercury poisoning, a common symptom of which is the falling out of the teeth. In wool sorting and in the handling of foreign hair the workers are apt to become inoculated with the bacillus of anthrax, and become victims of a fatal disease. Special risks apply to electrical works and processes, and recently much attention has been directed to the effects on workers engaged in electric welding of metal. Label licking in the making-up departments of thread mills creates ulcerations on the lips and mouth, and shuttle sucking provides a ready means of inoculation by tubercular disease germs. In the manufacture of glass there appears to be a considerable risk of the formation of cataract. In certain wet processes, such as occur in bleach works, laundries, and linen factories, we have the ordinary risks from exposure to damp. These examples can be very much multiplied, I know; but probably you will agree with me that I have given you quite sufficient to show the multiplicity of starting points of industrial disease.

I am afraid my paper suffers from many defects. The subject is a very large one, and I have therefore been compelled to jumble together a large number of facts, and have little space left for comment. I have not been able to advance a number of theories or make any particular new pronouncements. I hope, however, that I have succeeded in the main object, *i.e.*, to illustrate the advisability of directing the more particular attention of the bulk of the medical profession to the importance of studying the effects of trade processes upon the human organism.

THE Danish Royal Scientific Society has admitted as a foreign member, Dr. Dreyer, Professor of Pathology in the University of Oxford.

THE seventy-seventh annual meeting of the British Medical Association will be held at Belfast from 23rd to 31st July, 1909.

"RETURN CASES OF INFECTIOUS DISEASE."

By W. G. WILLOUGHBY, M.D., D.P.H.,
Medical Officer of Health, Eastbourne.

THE subject of return cases is a very old one with Medical Officers of Health, and my excuse for reverting to so well worn a subject is the occurrence in my district of a series of secondary cases of diphtheria in houses in which a previous case had occurred and from which the primary cases as well as the secondary cases had been removed to an isolation hospital. One of the most interesting points in the series is the fact that more of the secondary cases occurred either just before the return of the primary from hospital, or a very long time after such return, than occurred soon after the return of the primary case from hospital.

The question as to the connection between two cases occurring at intervals in the same house is a very important one, because the hospital is so often blamed after what are called "return" cases.

When more than one case occurs in a house the second and following cases may occur—

1. At practically the same time as the first case.
2. Within the length of the incubation period following exposure to contact with the first case before its diagnosis and removal.
3. After the end of the incubation period and before the return of the first case from hospital.
4. During the period shortly following the return of the first case from hospital or from isolation:
 - (i.) Within the incubation period of the disease;
 - (ii.) Beyond the time of the usual incubation period.
5. Many months afterwards.

Groups 1, 2, and 5 may be dismissed at present as being accidental and impossible of prevention or independent as far as the first case is concerned.

Group 4 forms the group of so-called "return" cases.

Group 3 is important, and represents infection not from the first case direct but possibly from the same source as the first case,

or from infection left in fomites, etc., from the first case, etc.

If the time during which cases occur in this group extends beyond the time the first case is in hospital, then they pass into Group 4, and the hospital gets the credit, or discredit, of sending out a case still infective.

The circumstantial evidence against the hospital for cases in Group 4 is of course strong, and borne out by certain corroborative circumstantial scientific facts.

The series of diphtheria cases of 1908 with the history of diphtheria in Eastbourne in previous years, however, shows that it is unwise to jump to such a conclusion without consideration, and that many so-called "return" cases have nothing to do with the return of the patient in cases of diphtheria.

Certain scientific facts show that genuine return cases occur. In the case of enteric fever, for instance, recent events have resuscitated what has been known for a very long time: *viz.*, that the infection of enteric fever will lie for a very long time dormant in a recovered patient, and that that patient may give enteric fever to others with whom he or she is brought into contact, as many as twenty or more years later. Such patients are known as "carrier" cases.

No such case has been traced in Eastbourne; but fortunately native cases are practically non-existent, and the imported ones are very few, so that there is not much opportunity to trace such cases.

In the case of scarlet fever it is usual to expect in England about 2 per cent. of return cases, but in Eastbourne as many as four years have passed without a single "return" case, and then we have had a series of such cases. When such a case is authentic and undoubted, it is invariably found, on examining the discharged patient, that there is some otorrhœa or rhinorrhœa, which has developed soon after leaving the institution.

It is frequently the fact that if a common cold occurs to a patient within a few days of convalescing from scarlet fever, the nasal discharge contains infection. It is advisable, if possible, to give the final disinfecting bath the day before discharge from hospital, so that the patient shall not be sent into the open air soon after a hot bath; convalescent wards are also advisable. Many of these so-called "return" cases, however, may be accidental and not connected with discharge from hospital, in the same way as the diphtheria

* Read before a meeting of the Southern Branch of the Society of Medical Officers of Health on March 5th, 1909.

cases I mention below must have been accidental and due to some other cause than than the discharged case.

In the case of diphtheria, with which I am here chiefly concerned, return cases are more rare. Until 1908 only one such case had occurred in Eastbourne in fourteen years, although there had been, in the aggregate, a large number of cases. In the case of diphtheria where the specific germ is known to exist on the throat, etc., it is surprising, perhaps, that in these fourteen years there had not been any return cases, for until recently it has not been the rule to examine the patients bacteriologically before being discharged, but to discharge them on clinical grounds alone.

In 1908 there were four instances where patients were sent to the hospital with diphtheria, from houses to each of which a cured diphtheria patient had been sent a few days previously. The intervals were ten, ten, twelve and twelve days. These may be called "return" cases, but the intervals are long for the incubation period of diphtheria, and there are circumstances which show that one cannot necessarily include them as "return" cases. In one case (Holloway), on receipt of the notification of the second patient, bacteriological examination of the discharged patient was at once made, and there were no diphtheria bacteria present. Moreover, later on a third patient came from the same house.

In another cases (Joyce) of these four, there was an intermediate case, beyond the incubation period of the first, showing that the infection was still lingering in the neighbourhood, and that intermediate case was taken away five days before the discharge of the first patient, so that this was probably not an instance of a "return" case. If investigation had been made in the other two instances, I have no doubt it is quite probable that these also would have been shown to have been coincidences, quite as likely as "return cases."

There were in all eleven instances where patients came from the same house as a first case, the first having returned. The intervals were in three instances as long as 110, 195 and 210 days, and in one case the same patient returned after being home seventy-five days. This shows abundantly that coincidences do occur and that it is as likely that the second patient is infected in the same way as the first patient, as that they obtain the disease afresh on the return of the first patient from hospital.

The following five instances where the second

case developed immediately *before* the return home of the first patient show even more clearly how mistaken it is to attribute the second case always to the return home of the first case:—

	Discharged.		Admitted.
(1.) I. Jones	Dec. 31st	W. Jones	Dec. 30th
(2.) S. Coomber	Nov. 17th	B. Coomber	Nov. 10th
(3.) W. Bontoft	Nov. 3rd	J. Bontoft	Oct. 19th
(4.) N. Joyce	Nov. 26th	T. Joyce	Nov. 21st
(5.) B. Parker	Dec. 7th	C. Parker	Dec. 1st

These cases are striking instances which show that so-called "return" cases are frequently mere coincidences, particularly when they occur in a district from which a number of cases are being removed to the hospital at about the same time.

It is worth while, I think, to record in connection with hospitals and return cases that when for the first time in my experience a sufficiently large number of cases occurred to get a fair estimate, there were actually more instances of the secondary case occurring just immediately before the return of the patient from hospital than there were of the secondary case occurring just after the discharge of a patient from hospital.

Just a week or two ago in the hospital I attend, E. A. was discharged on February 19th, after a negative bacteriological examination, and her brother, W. A., was admitted with diphtheria on February 26th.

In the case of scarlet fever, I have not such a striking list of coincidences to quote, but in one case a patient was discharged to a house on September 22nd, and a second case occurred and was removed to hospital on September 20th.

I note the agenda states that the discussion is to include the measures that should be taken to prevent return cases.

With regard to enteric fever, in the event of cases occurring whose cause cannot be traced, it is worth while examining the dejecta of any person with whom the patients have been in contact that has had enteric fever. It is not practicable to make any enteric fever patient take precautionary measures all the rest of his or her life because of an occasional "carrier" patient.

As regards scarlet fever, besides the use of convalescent wards and dealing with adenoids and enlarged tonsils in the patient, it is, I think, of importance in this respect that adenoids and large tonsils should be attended to in every child. I have noticed that children suffering in this way are most susceptible in

scarlet fever to ear mischief. Some such throat medicament as formalin—in form such as formamint—used in the early stage is useful to prevent ear mischief. It is practically invariably the nose or ear that is the cause of a true return case.

The final disinfecting bath before discharge should not be given just immediately before sending the patient out, especially in cold weather, for this often sets up a nasal discharge where one did not previously exist.

Irrigations before discharge are useful.

In the case of diphtheria, one can find by bacteriological examination that the throat and nose are free from infection, and in cases where the infection apparently lasts a very long time the virulence of the bacilli might be tested. I need not dwell on this point, but would refer you to the very complete paper read before the Society recently on diphtheria by Dr. Savage, of Colchester.

REVIEWS.

THE PRINCIPLES OF HYGIENE AS APPLIED TO TROPICAL AND SUB-TROPICAL CLIMATES. By Prof. W. J. R. Simpson. Published by John Bale, Sons & Danielsson. 1908. Price 15s. net.

The responsibilities of Empire send Britons forth unto the uttermost parts of the earth and bring them in contact with climatic conditions which, in the absence of proper precautions, are fraught with great danger to health. Hence it is a matter of much importance for all who intend to reside in tropical or sub-tropical climates to ascertain what those precautions are, and for this purpose there is no better preparation than a study of the present volume. Professor Simpson has done well to publish his lectures, for public interest in the subject has been steadily growing of recent years and there was much need of a book that should bring together the chief facts in a handy and accessible form. The general principles of hygiene are the same the whole world over, but, as Professor Simpson points out, the methods by which they are applied need to be adapted to particular circumstances. As an example, he mentions that "because water-sealed traps, properly ventilated, are excellent and successful appliances in English towns to keep gas from the sewers gaining access to the dwelling-house, it by no means follows that they are equally useful for the tropics, where such traps are almost certain to be unsealed by evaporation in summer, and by pressure through storms in the rainy season." Tropical hygiene, therefore, while following on the lines of general

hygiene and sanitation must be applied with adequate knowledge of the special conditions of tropical climates, and must include measures peculiar to those climates.

Professor Simpson treats his subject succinctly and comprehensively. His book surveys the whole field of tropical hygiene, and on all points it is thoroughly practical and helpful. One admirable feature is the importance that is attached to measures of personal hygiene—a matter that is too frequently neglected by Europeans living in hot countries. The book is written in a lucid and highly interesting way, and it may be strongly recommended not only to medical practitioners and officials, but also to all intelligent persons who live or are about to live in tropical or sub-tropical climates.

THE FOOD INSPECTOR'S HANDBOOK. By Dr. Francis Vacher. Fifth edition. The Sanitary Publishing Co., London. 1909. Price 7s. 6d. net.

Dr. Vacher is to be congratulated on the appearance of the fifth edition of his excellent handbook. Since the first edition was published some sixteen years ago other text-books have entered the field, but Dr. Vacher's volume still holds its own, and is likely to do so for a long time to come. The present edition has been carefully revised and brought thoroughly up to date and much new matter has been added. The recent statutes and regulations relating to food are explained, the list of diseases described has been extended, and twenty-seven new drawings have been included. The size of the book, however, has not appreciably increased; it still remains a handy volume full of practical information and destitute of padding. Its continued success is a proof of its usefulness, and we have no doubt that the present edition will be as warmly welcomed as its predecessors.

THE INFLUENCE OF HEREDITY ON DISEASE, WITH SPECIAL REFERENCE TO TUBERCULOSIS, CANCER AND DISEASES OF THE NERVOUS SYSTEM. Longmans, Green & Co. 1909. Price 4s. 6d. net.

The Council of the Royal Society of Medicine have published in the present volume the discussion on heredity and disease that took place in the Society's rooms on November 11th, 18th, 26th, and December 2nd, 1908. The discussion, which was opened by Sir Wm. Church, Sir Wm. Gowers, Dr. Arthur Latham, and Dr. E. F. Bashford, contains contributions by Prof. Bateson, Prof. Karl Pearson and other distinguished authorities, and it forms the most complete modern statement of this important subject. Recent discoveries and the advance of public

opinion have almost brought the control of the hereditary factors in disease within measurable distance of the sphere of practical politics. The importance of the subject can hardly be exaggerated, and no one who is interested in the prevention of disease should fail to study the various aspects of the problem as they are presented by the contributors to this discussion.

OBITUARY.

SEPTIMUS GIBBON, B.A., M.B., Cantab, M.R.C.P., late Medical Officer of Health, Holborn.

We regret to record the death of Dr. Septimus Gibbon, which took place on April 17th. Dr. Gibbon, who had attained the age of 84, was educated at Clare College, Cambridge, and at St. Bartholomew's Hospital, and obtained his qualification in 1851. He held the posts of House Physician at Addenbrooke's Hospital, Assistant Physician at the London Hospital, Lecturer on Natural Philosophy at St. Bartholomew's Hospital. During the Crimean War he was physician to the Civil Hospital, Smyrna, where he was associated with the work of Miss Florence Nightingale. When the Metropolis Management Act of 1855 made the appointment of Medical Officers of Health compulsory in London, Dr. Gibbon was appointed to the district of Holborn, where he was Medical Officer of Health for nearly forty years, being thus one of the forty-eight original metropolitan Medical Officers of Health. He was also one of the original members of the Metropolitan Association of Medical Officers of Health, which, founded in 1856, was the first of the associations whose amalgamation in 1887 formed the Society of Medical Officers of Health. Dr. Gibbon was Vice-President in 1873-75, and was a member of the Society until his death. Dr. Gibbon was much interested in church work, and was for a long time editor and proprietor of *The Church of England Pulpit*, in which journal he gave vigorous expression to his views on the education controversy. He was a man of much intellectual power and many-sided interests, and was held in great esteem by all amongst whom he worked.

MIDWIVES ACT COMMITTEE.—The eleventh meeting of the Departmental Committee appointed by the Lord President of the Council to consider the working of the Midwives Act was held at the Privy Council Office on May 5th, Mr. Almeric W. FitzRoy, the Clerk of the Council, presiding. Evidence was tendered on behalf of the British Medical Association by the following witnesses:—Mr. J. Smith Whitaker, M.R.C.S., L.R.C.P., Medical Secretary of the Association; Mr. C. E. S. Flemming, M.R.C.S., L.R.C.P., Bradford-on-Avon; Dr. L. S. McManus, Wandsworth; and Mr. J. H. Taylor, M.B., Salford.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856.

RECONSTRUCTED 1888.

INCORPORATED 1892.

Southern Branch.—Minutes of Meeting held at the Junction Hotel, Eastleigh, on April 30th, 1909, at 2 p.m. *Present*:—Drs. Lauder (President), Bygott, Cameron, Fison, Gibson, Griffith, Hemsted, Legate, Livingston, Lyster, Maturin, Meyrick, Parkinson, Pern, Roberts, Routley, Stott, Walker, Watts, with Drs. Bartlett and Maples as visitors. Ten new Fellows of the Society were elected Members of the Branch, and Dr. Routley, Aldershot, was transferred from the H.C. Branch.

After confirming the minutes of the previous meeting, the President's Supplemental Draft to the Departmental Committee (Midwives) was considered, and the amendments taken *seriatim*.

(a and b.) The Branch agreed that the "covering" referred to was a matter in which the responsibility rested on the medical men rather than on the midwives.

(c.) A definition was drafted and agreed to as follows:—

"A woman who 'practises or acts as a midwife' means one who accepts an engagement for a confinement without the attendance of a registered medical practitioner."

(d.) No cases are supplied.

(e.) One case was given in detail, to be forwarded to the Honorary Secretary of the Society.

A discussion followed on the Tuberculosis Regulations, 1908, and the Memorandum of the Medical Officer of the Local Government Board on Administrative Measures against Tuberculosis.

Dr. STOTT gave an account of the work which had been done in his combined district, and the methods of dealing with tuberculosis, referring specially to the arrangements for bacteriological examination of sputum, and for the veterinary examination of cows.

Dr. Lyster emphasized the necessity for tact in carrying out the instructions, and the importance of voluntary notification, notices in public-houses, and bacteriological diagnosis as the first steps.

Dr. PARKINSON mentioned the infection by milk, and the value of a movable hospital for country districts.

The discussion was continued by Dr. Griffith, the President, Drs. Bygott, Maturin, and others; and Dr. Stott replied to several questions.

It appeared that a great deal of work had already been done in the districts represented, differing in its nature and extent; and the advantage of adopting similar methods in all areas was pointed out.

Yorkshire Branch.—A meeting of the Yorkshire Branch of the Society of Medical Officers of Health was held on April 23rd at York, under the presidency of Dr. J. T. Neech (Halifax). There were present:—Dr. G. Newman (Chief Medical Officer of the Board of Education), Alderman Border (chairman of the York Health Committee), Dr. J. R. Kaye (Wakefield, hon. secretary), Dr. E. M. Smith (York), Dr. B. Stedman (Selby), Dr. S. G. Moore (Huddersfield), Dr. H. C. T. S. Langdon (West Riding), Dr. J. Knight (Scarborough), Dr. A. P. Thomson (Hull), Dr. J. A. Sutherland (Cleckheaton), Dr. A. Raimes (York), Dr. T. Gibson, Dr. T. Adam, and Dr. T. Orr (Wakefield), Dr. G. H. Pearce (Huddersfield), Dr. A. Robinson (Rotherham), Dr. T. Johnstone (Harrogate), Dr. J. M. Wilson (Beverley), Dr. Wright Mason (Hull), Councillor Beckett (chairman Rotherham Education Committee), Dr. Veitch Clarke (Leeds), Dr. Templeton (Doncaster), Dr. Galbraith (York), Dr. Erskine (Goole), Dr. Halliwell (Dewsbury).

Discussions were held on the influences of the school as a pattern of hygiene for the home, on the cancer pamphlet proposed to be issued by the British Medical Association, and on the use of infectious diseases hospitals for the treatment of consumption.

In the evening the annual dinner was held at the Station Hotel, York, Dr. Neech, the President, being in the chair.

THE PRESIDENT submitted the toast of "The King."

THE NATION'S PRIMARY ASSET.

Dr. G. NEWMAN, in proposing "The Public Health Service," said there were two things which he would like to say. The first was that they were fortunate as members of the Society, they as members of one branch and he of another, in being officers of public health at the time of its emergence, and that was not too strong a word to use. They had seen an extraordinary change take place: that not only medicine was officially associated with the State for the first time in history, but that it was open to them to be members of a society connected with the public health service. He was not an authority on the subject which was at present interesting every Englishman as to how the country was to be defended, but if they were determined that it was to be defended, in the best sense of the word, it must not depend on battleships alone, but on the new way of the life of the people, and that new way must be based and founded on the clear understanding in the mind of the people and of the State that the health of the people was the nation's primary asset—that it was unimportant to consider the defence of the people unless they had a nation worthy of defence. He was not ashamed

to confess that from the emergency of the public health service at this particular juncture the English people were learning, and should learn, the great lesson that it was on the physical condition of the race that our future depended. He had had recently to pay a very pleasant and interesting visit to Germany with others on official business connected with the Board of Education, to see how medical inspection and hygiene work was done in the various towns and cities, and he would say that whatever else Germany was taking care of she was taking care of her people. It might be true or not that England took care of her property, such as lands, etc., but Germany was taking care of her people. If that broad distinction be true it behoved the English people to consider how far they were losing ground, not by way of battleships, but how far England was losing the position which came to her by the emergence of the public health service. He believed the nation must call attention to the fact that only on the physical vitality of the people could the nation stand. He believed they were doing that by means of the medical officers of health. Having spoken of the great importance of the environment of the people, Dr. Newman, on behalf of the Board of Education, expressed its great appreciation of the work done by local education authorities throughout Yorkshire with regard to the medical inspection of school children. The work had been well and wisely established and was being carried out with enthusiasm and common-sense, which was its greatest hope.

THE PRESIDENT, replying to the toast, said that the Yorkshire Branch was one of the most important branches, if not the most important branch, of the Society; and he thought that it could fairly lay claim to having had a very successful career. It was possible that the branch had not attained to the utmost possible degree of success, but ideals were very seldom fully realised. He eulogised the services of Dr. Kaye, the hon. secretary, who had always taken a great interest in the Society. He had been hon. secretary of the branch for fifteen years, and when he took the position the number of members was seventy-eight: now it was 146. In the area covered by the Yorkshire Branch there were 180 medical officers of health, and he asked the members to use their influence to get the thirty odd officers outside the Society to join its ranks, and by that means add to the power and influence of the public health service in the district. It was interesting to mention that the Yorkshire Branch of the Society had its origin in York. It was founded at the end of 1874 under the presidency of the late Dr. North. The object of the Society and the object of the public health service was the advancement of the public health and sanitary science, so that it existed not only for the interest

of the members but for the public benefit and the public good. The members had been largely the means of educating the public mind on sanitary matters. The medical inspection of school children was advocated by the Society thirty years ago. With the constantly increasing amount of public health legislation the responsibilities and duties of medical officers were becoming greater year by year, yet the medical officer of health did not seem to occupy the position of importance which his services entitled him to. They were not, however, dismayed by the difficulties they had to face, but would continue their course with energy and enthusiasm.

HEALTH OF YORK.

ALDERMAN BORDER proposed "Our Society," and having expressed the great pleasure he felt in being associated with the public health work of York, and being connected with Dr. Smith in that work, said that the cause of the public health was one of the greatest importance. Within the last two or three centuries it was thought necessary that all the citizens should live within the city walls, and various properties became unfit for human habitation. It was property of that kind that Dr. Smith and the Health Committee had had to contend with. It was almost an iniquity; but for some years, he was glad to say, as far as regarded the public health work of the city they had made undoubted strides, and owing to the action of the health authorities York had become a better place to dwell in than it used to be.

COUNCILLOR BECKITT supported the toast, and said that there was not the slightest doubt, as had often been repeated at Corporation meetings, that the health of a town or a community was the wealth of that particular town or community, and he quite realised the fact that there were no officers of any local authority who were so calculated to promote that end than the gentlemen who were met there that night.

DR. J. R. KAYE replied to the toast. He said that evidence of the robustness of the Society was supplied by what they saw that evening. There was a balance of over £26 plus the subscriptions in hand, and they now had a membership of 149. Dr. Newman had touched on a subject which was of particular interest to him, and that was that health was the first essential of life. As surgeon-major to the Territorial Force he had tried to demonstrate over and over again that disease and suffering, more than the sword and the bullet, were the main elements in proving the efficiency of an army. That was proved in the two Ashanti wars.

DR. E. M. SMITH proposed the health of the President. He said it was exceedingly pleasant to him to see such a gathering on the occasion of their annual dinner being held for the first

time in York, and he expressed the hope that in the future it would become an institution to hold the dinner at least every three or four years in the capital of the county. He congratulated Dr. Neech on presiding over such a gathering, for it was a great privilege to have met Dr. Newman in friendly intercourse, not only because of his high position but because of his delightful personality. He (Dr. Smith) felt strongly that if their truly great work, of which they were only on the threshold, and the possibilities of which had only yet been tapped, was to be made a thorough success the Board of Education would have to consider the necessity of making local authorities a grant in aid.

THE PRESIDENT said he was glad that during his presidency they had made the departure from the general rule and had come to York, seeing that it was the place in which the branch first "drew breath."

During the evening Mr. F. Holmes (humorist) and several of the company sang some excellent songs, Dr. E. M. Smith kindly acting as the accompanist.

Northern Branch.—A meeting of this Branch was held at Newcastle-on-Tyne on April 23rd last. *Present*:—Dr. Andrew Smith (chair), Drs. Armstrong, Arthur, Kerr, Foggin, Renney, Mostyn, T. Wilson, Trotter, O'Brien, Hislop, and Taylor.

Drs. Smeddley, Leigh, Boleyn, and O'Brien were elected members of the Branch.

Drs. Hill and Smith were elected Representatives on the Court of Governors of the University of Durham College of Medicine.

DR. KERR, Assistant Medical Officer, Newcastle-on-Tyne, read his paper entitled "Some Difficulties in the Control of the Milk Supply."

A discussion followed, in which Drs. Armstrong, Smith, Renney, Mostyn, and others took part, and a cordial vote of thanks to Dr. Kerr terminated the meeting.

APPOINTMENTS.

T. S. HIGGINS, M.B., B.S., Assistant Medical Officer of Health for Birmingham.

CHARLES PORTER, M.D., C.M. Edin., M.R.C.P., Barrister-at-law of the Middle Temple, Medical Officer of Health for Marylebone.

LEWIS POTTER BLACK, M.B., B.C. Cantab., L.R.C.P. Lond., M.R.C.S., D.P.H. Lond., Medical Officer of Health for the St. Thomas R.D.C. (Devon).

R. S. PARK, M.B., B.S., St. And., Medical Officer of Health for the Houghton-le-Spring R.D.

J. F. FERNIE, M.R.C.S., L.R.C.P., Medical Officer of Health for the Stone U.D.

LAW REPORTS.

COURT OF APPEAL.

May 5th, 1909.

BEFORE LORD ALVERSTONE, L.C.J., FLETCHER MOULTON AND FARWELL, L.J.J.

HAURAHAN v. LEIGH-ON-SEA URBAN DISTRICT COUNCIL.

Public Health Act, 1875, Section 159.—Conversion of a Railway Carriage into a Dwelling-house — Breach of Bye-laws — Demolition of Building.

This was an appeal from a judgment of a divisional court (reported *ante* page 278) which confirmed a judgment of the county court of Southend. The plaintiff had converted an old railway carriage into a dwelling-house, and in so doing had not complied with the bye-laws. The defendants had, after various proceedings, caused the whole carriage to be pulled down. The plaintiff, in consequence, brought an action for damages for trespass. The county court judge held that the defendants were justified, and entered judgment for them. The divisional court dismissed the appeal, and the Court of Appeal now dismissed the appeal from the divisional court.

LORD ALVERSTONE said he agreed with the judgment of the court below. By Section 159 of the Public Health Act, 1875, the conversion into a dwelling-house of any building not originally constructed for human habitation was to be considered as the erection of a new building. That gave the local authority jurisdiction in the case, and he did not think they had exceeded it.

FLETCHER MOULTON and FARWELL, L.J.J., were of the same opinion.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

February 8th, 1909.

BEFORE LORD ALVERSTONE, L.C.J., WALTON AND JELF, J.J.

KERSHAW v. BROOKS.

Metropolis Management Act, 1855, Sections 76, 202.—County Council Bye-laws—Person Responsible for the Work—Construction of Drains. *The person responsible for breaches of the bye-laws of the London County Council in connection with the reconstruction of drains is not necessarily the person who did the work, but is the person responsible for the work being done.*

This was an appeal by cases stated from two decisions of a Metropolitan Police Magistrate given upon two informations in respect of bye-laws, which bye-laws were made by the London County Council pursuant to the Metropolis Management Act, 1855, Section 202. The bye-laws in question related to the reconstruction of drains. The informations were laid by W. G. Kershaw,

sanitary inspector of Hampstead Metropolitan Borough Council, against one Brooks, a plumber, who had done the work in question. The only contention put forward by the defendant was that he was not responsible, as he merely did the work for and on the order of the owner of the house.

The bye-laws in question applied to any person who shall construct or reconstruct any pipe or drain.

It was found that the respondent was a plumber and was employed by one Kellow, the owner of the house, to do certain necessary sanitary works in connection with the conversion of the house into flats. Kellow was a builder. The work was actually done by the respondent's son. The magistrate held that the owner was the person who ordered the work to be done, and that he was the person responsible for the breaches of the bye-laws and dismissed the informations in both cases.

The Court dismissed both appeals.

LORD ALVERSTONE, L.C.J., said that on the facts before the Court there was nothing to show but that the respondent carried out orders which were given to him by the owner of the house. He did not think that under these bye-laws or under Section 76 of the Metropolis Management Act, 1855, it was meant that the notice should be given by the person doing the work and not by the person responsible for the work being done. Bye-laws could be framed so as to include such persons, but where there was a work of construction and a number of different trades employed it might create the greatest difficulty if the notice had to be given in every case by the person actually doing the work. If these bye-laws were intended to apply to the persons who actually did the work as apart from the person responsible for the change in the house, there should have been a definition clause in which the word "person" was so defined. He thought the magistrate was right.

WALTON and JELF, J.J., agreed.

ADULTERATION AS A FINE ART.—Every year the administration of the Food and Drugs Acts becomes increasingly difficult. Adulteration is now almost a fine art, and the market is flooded with so-called "preservatives" which are stated to defy discovery by any analyst. I think it would have been well if the recommendation of the Select Committee on the Use of Preservatives, "that the presence of preservatives and the amount in any food substance should in all cases be declared," had been included in one of the numerous Acts. The public must be protected in regard to its food supply, and that protection cannot be more satisfactorily given than by making the tradesman state clearly what the article is that he is selling.—*Annual Report of Dr. W. H. Symons, Medical Officer of Health, Bath.*

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Public Health

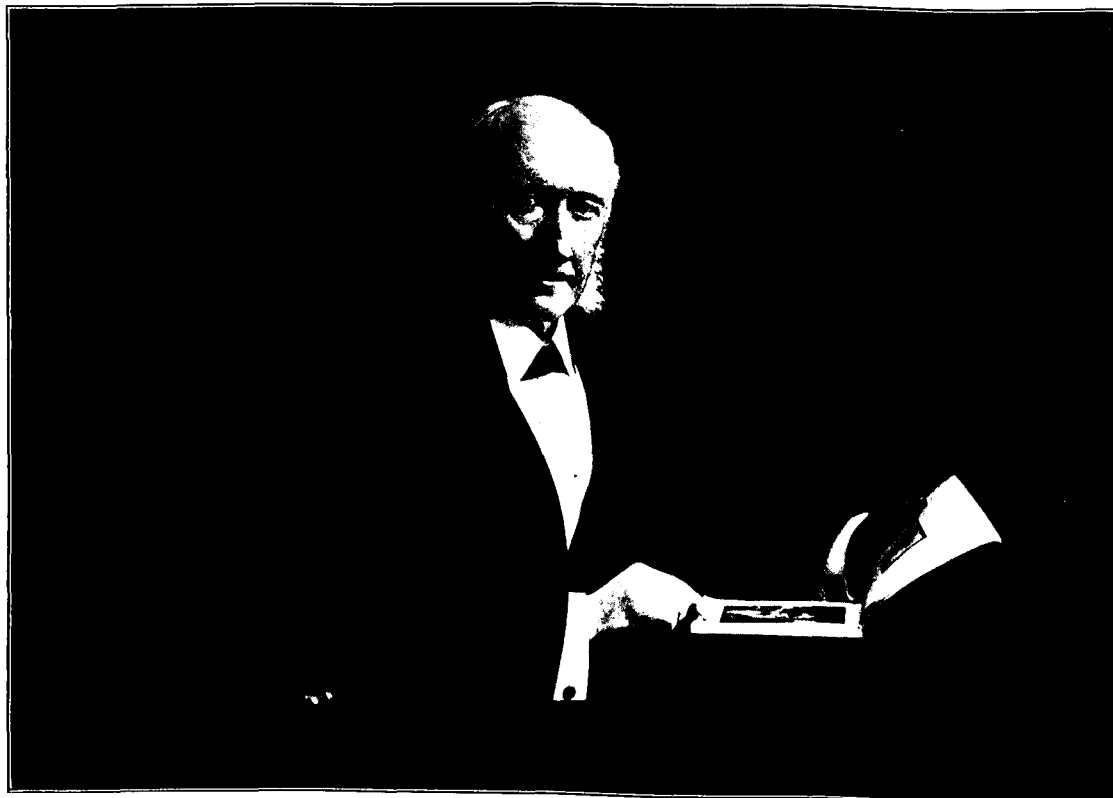
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JOHN F. W. TATHAM, M.A., M.D., F.R.C.P., D.P.H.,

Superintendent of Statistics, General Register Office, Somerset House, 1893-1909.

Hon. Fellow, Society of Medical Officers of Health.

THE TEACHING OF TEMPERANCE IN PUBLIC ELEMENTARY SCHOOLS.

THE teaching of hygiene in public elementary schools may be regarded as one of the most promising measures that make for the improvement of the public health, and no department of hygiene is more important than that which relates to temperance. But though it is easy to advocate the teaching of temperance in schools, it is difficult to frame a good working scheme of instruction that shall meet with general acceptance. In the syllabus of lessons in temperance recently issued by the Board of Education the difficulties that attend an undertaking of this kind have been successfully overcome, and the result is a thoroughly practical document which we have no doubt will have a far-reaching effect. In a brief prefatory note Sir Robert Morant expresses the hope of the Board that instruction in temperance will be given by the regular teachers as "part of the teaching of the elementary rules of personal health which should be included in the curriculum of every school." The Board have issued the syllabus as a model to which all instruction in temperance should conform, and it is stated that they will not be prepared to approve, under Article 3 of the Code, any syllabus of instruction that departs substantially from this model. It is suggested that not less than three lessons in the subject should be given each year, and that lessons on the matter of the third section of the syllabus should only be given to children who are over twelve years of age. Sir Robert Morant concludes his prefatory note by pointing out that teachers should base their instruction upon the broad facts of common experience, rather than upon the results of laboratory experiments, and that they should avoid anything that may excite morbid curiosity or fear. Instruction on temperance, he remarks, "should itself be

temperate, and should make a sober appeal to such reasoning capacity as a child possesses, and to the ideas of decent, self-respecting and dutiful living which every good teacher endeavours to present to and cultivate in the children under his charge."

The syllabus consists of three sections. The first describes the various kinds of food and beverages, and the special usefulness of each kind; and in this section it is definitely laid down that children and young people should in no circumstances take alcoholic beverages except by a doctor's order. The second section explains the characteristics of alcohol and its chief effects on the body. The third section (which is intended for children over twelve only) deals with the evil consequences of intemperance to the individual, to the home and to the State. It is intended that the lessons shall be given in the form of question and answer, and the syllabus is followed by a series of notes which explain in detail the kind of information the teachers are expected to impart. The notes contain tables showing the occupational mortality from alcohol in various trades, and the expectancy of life in the general population and among total abstainers. In these notes, which occupy only about a dozen pages, a vast amount of information is presented in a remarkably clear form, and as the original references are given the reader is encouraged to pursue his inquiries further into the subject.

The whole document is a valuable addition to public health literature, and although many temperance workers will probably think it would have been improved by the omission of paragraph 5 of Sir Robert Morant's prefatory note, it will no doubt secure a large measure of acceptance, and we hope it will find its way into the hands of every medical practitioner, as well as every teacher in the country.

PUBLIC HEALTH AND PARLIAMENT.*

By F. E. FREMANTLE, M.B. (Oxon.), M.R.C.P.,
F.R.C.S.,

County Medical Officer, Herts.

THIS subject is one of constant interest to medical men, one which is constantly being discussed, and one in which it is generally agreed in our profession that there is a great scope for development. But despite this fact I have been unable to find any comprehensive account of the work of the medical profession in Parliament, either as it has been done or as it might be done, nor any detailed history of the passage through Parliament of measures bearing on medical questions and of the steps that lead up to their passing. You will perhaps forgive a somewhat disjointed account, certainly a very limited account, of the many sections into which the subject may be divided.

DOCTORS IN PARLIAMENT 1880-1908.

During the last 30 years the representation of the medical profession in Parliament has been as follows:—

Prime Minister.	Date of First Opening of Parliament.	Conservatism.	Liberal Unionists.	Gladstonian Liberals.	Parnellites.	Nationalists.	Independent Labour.
Gladstone...	April, 1880	1	—	2	—	2	—
Gladstone...	February, 1886	—	—	2	1	—	—
Salisbury...	July, 1886	2	1	4	4	—	—
Gladstone...	August, 1892	—	—	5	—	6	—
Salisbury...	June, 1895	1	1	4	—	7	—
Salisbury...	November, 1900	2	2	3	—	3	—
Campbell-Bannerman	February, 1906	2	1	8	—	2	—
Other candidates at the election of 1906		1	4	5	—	1	1

Those elected to the present Parliament were:—Drs. Rutherford Harris (retired in May, 1906), Sir J. B. Tuke, Sir R. B. Finlay, K.C., Sir W. J. Collins, G. Cooper, Sir B. W. Foster, C. H. Pollard, R. J. Price, R. A. Rainy, Sir G. Scott Robertson, K.C.S.I., V. H. Rutherford, R. Ambrose, and J. Dillon.

Sir R. B. Finlay, K.C., was Attorney-General in the late Government, and the only other of our profession who has held office in recent years is Sir B. W. Foster, who was Secretary to the Local Government Board under Mr. Gladstone and Lord Rosebery, from 1892 to 1895.

But while we are dealing with Parliament we must never forget that there are two Houses

* Presidential Address to the Home Counties Branch of the Society of Medical Officers of Health, October 15th, 1908.

with equal powers, and small as is the representation of our profession in the lower House, it is even smaller in the upper.

Our only representative, although one of world-wide and lasting fame, is Lord Lister, P.C. and of the Order of Merit, a Conservative. Lord Lister, alas, was born 81 years ago, and although it would be impossible to imagine a more distinguished representative of any profession, we cannot help being aware that Lord Lister is unable to engage in public work, and that our profession is practically, therefore, unrepresented in the work of the House of Lords.

The inadequacy of medical representation in the lower House is shown by a glance at the classification of members by their professions. We may take the following groups:—

Medical, 12; teaching, 15; newspaper proprietors, 16; printers and publishers, 13; coal and iron, 19; shipping, 27; navy, 4; army (regulars), 47; authors and journalists, 52; land owners and sons of land owners and peers, 85; barristers and solicitors, 171.

This numerically excessive representation of lawyers may perhaps be justified on the ground that the legal profession are trained to represent all professions and all spheres of life; but to this we would reply in return that they represent everything in legal terminology and in legal form, and that we, as representing the scientific, can lay at least an equal claim to represent all classes of mankind in the country, and that the sooner the country realises the advantage of scientific as opposed to legal terminology, and of scientific as opposed to legal methods of procedure, the sooner they will be able to clear away the mists that obstruct the view of all problems of social and national importance in Parliament.

Finally, in our review of Parliament as it is at the present moment, we must know that whereas the 670 members have to represent the 45 millions population of the United Kingdom, there were as many as 658 members to represent the 15 millions of the United Kingdom—that is, one-third of the present population—after the union with Ireland in 1801; while our Parliament after the union with Scotland in 1707 contained 558 members, and under Queen Elizabeth in 1603, for the few millions in England and Wales there were 462 members. It would seem obvious that the present Parliament, to represent a nation of such comparatively vast size, with all the increase of imperial and national duties thrown

upon it, and with the vast increase of facilities for communication, which throws upon members not only opportunities but most onerous duties, should be extended to something like ten times its present number if it is to cope as well with the work as it did in the time of Queen Elizabeth without requiring members to make a profession of it. Here would be a fine opportunity for the better representation of the medical profession.

MODERN MEDICAL LEGISLATION.

Our second heading this evening will be the subject of medical legislation, past and present, how far this has been good, how far bad; how far it has been due to medical advice within and without the House, how far to the laity, and how far it has been due to either party or to independents.

On this point it may be well to give a history of the Public Health Act of 1875. I would recommend everyone interested in the public aspect of medicine to read, if they have not already done so, the great work entitled "English Sanitary Institutions Reviewed in their Course of Development and in some of their Political and Social Relations," by the late Sir John Simon, K.C.B., the first medical officer of her late Majesty's Privy Council.

Sir John Simon, while engaged in active surgical work as surgeon to St. Thomas's Hospital, took a special interest from the first in the relationship of medical science to the national health. He was appointed Officer of Health for the City of London in 1848, in accordance with the City Sewers Act of that year. He was appointed medical officer to the General Board of Health in 1855. From that he carried his post and papers on to the Privy Council in 1858, and to the Local Government Board in 1871, retiring in 1876. The shaping, therefore, of the 1875 Act, in so far as it was due to medical advice, was due to a large extent to Sir John Simon, but the passing of it, and indeed to a considerable extent the shaping of it, was mainly due to Mr. Edwin Chadwick, who may be considered the pioneer of public health in this and therefore in any country of modern times.

Mr. Chadwick was born in 1800. Educated as a layman for the bar, he became early interested in the condition of the poor; and in so doing he realised the terrible physical conditions of their life. In 1832 Mr. Chadwick was appointed one of the assistant commissioners of inquiry into the working of the poor law and in 1833 was appointed to a royal commission

to examine the treatment of children in factories. In 1834 the report of that royal commission showed the anarchy prevailing in the place of public health law in England. In 1838 and the next following years, the Poor Law Commission, stimulated by Mr. Chadwick, initiated eventful proceedings which led to the public health legislation of 1848. A special Public Health Commission of 14 members was appointed in 1843, and contained only one medical man, but it also contained Mr. Lyon Playfair, afterwards Lord Playfair, and Professor Richard Owen, who was afterwards knighted and died in 1892. Their work was largely founded and stimulated by the three-volume report by Mr. Chadwick in 1842 on the "practice of interments in towns," which dealt not only with this point but also with various other social relations of death.

In 1848 the General Board of Health was founded to last for 10 years, after which it was merged into the Privy Council. The constitution of this Board is interesting. Lord Morpeth, afterwards first Earl of Carlisle, had carried the Public Health Bill of 1848 through the House of Commons. Lord Seymour, afterwards 12th Duke of Somerset, Lord John Manners, and Sir William Molesworth held an ex officio seat as First Commissioner of Works in turn. Lord Ashley, afterwards 7th Earl of Shaftesbury, and Mr. Chadwick made up the first Board, but within two years a medical member was appointed in Dr. Southwood Smith, who had done much of the investigation for the royal commissions which lead to the establishment of the Board.

But it was Mr. Chadwick who laid down that all sort of town refuse is best removed by a scour of water in properly made sewers. It was Mr. Chadwick who laid down the desirability and possibility of supplying even the lowest class of house with pure water from a public source; and several useful provisions were made and several useful Acts of a medical order were passed by the Board. So great, indeed, was Mr. Chadwick's influence in Parliament (although he never had a seat in the House) that the Government were actually defeated in 1854 on the Bill to continue the Board of Health, and the animosity which was raging against the Board and particularly against Mr. Chadwick as its chief working member had that critical opportunity for making itself felt. The opponents of the Board insisted that the Act of 1848, which had become law under the express provision that it should

continue in operation only for five years, should not be renewed except with a radical reconstitution of the central authority, and, in effect, with Mr. Chadwick's removal from office. Lord Palmerston brought forward the Government proposal to renew the Act, subject only to a control to be exercised over the Board by the Home Secretary. The Board, he said, "had had to manage arrangements which conflicted with the fair and legitimate interests of many very intelligent and very active men." They had interfered with the lucrative business of obtaining local acts, with the profits of water companies, actual and projected, and with the previous opinions and employment of local engineers; and "all things considered it was not to be wondered at that great prejudice should be created against them, in many respects without good and proper justification."

Opposition to the Government proposal was moved by Lord Seymour in a strong and very bitter speech; others followed in the same tone, siding with the offended interests, and the leader of the House, Lord John Russell, closed the debate. In doing so he referred particularly to the personal attacks which had been made on Mr. Chadwick, and here, though he dwelt with earnestness on his sense of Mr. Chadwick's eminent merits and services, he seemed not able to withhold from the House that, in his opinion, Mr. Chadwick had been an injudicious administrator.

"Like many other men, ardent reformers, he very often, in his zeal for amendment as he conceived it, overlooked or disregarded the objection and repugnance with which his views and propositions were received by others. . . .

"With respect to this Health of Towns Act, no doubt in many instances Mr. Chadwick's proposals (like his proposals formerly at the Poor Law Board) had given offence, for obviously many towns would rather be let alone. . . .

"There were likewise many persons who were pecuniarily interested that the plans of the Board should not be adopted, and it was very probable that Mr. Chadwick had not observed towards these classes of people the most conciliatory tone possible."

The Bill proposing to continue the Board was defeated by a majority of 74 to 65, and on the following day the First Commissioner of the Board of Works introduced the Public Health Bill of 1854, giving effect to the views of the majority. But Mr. Chadwick had laid the foundation of sanitary reform. The newly

constituted Board lasted four years, and was coincident with the year of Army Sanitary Reform, resulting from the Crimean experiences and the Crimean Sanitary Commission.

The medical machinery of the Privy Council, which took over the work in 1859, was the gradual working out of Mr. Chadwick's ideas under the expert advice of Sir John Simon.

In 1869 was appointed the memorable Royal Sanitary Commission, which reported in 1871, and on the publication of the report of that Commission it was left to the President of the Poor Law Board, Mr. Goschen, afterwards Viscount Goschen, to move the two Government Bills which expressed his scheme for the formation of the Local Government Board. The scheme was worthy of Mr. Goschen's exceptional powers. The new Board welded together the staff of the Poor Law Board, the staff of the General Register Office, the staff of the Local Government Act Office, and, with limitations, the administrative staff of the Medical Department of the Privy Council Office. As is the rule in British politics and British institutions, the Board was a compromise. It was the result of a struggle between the Poor Law administration, which is essentially a non-medical affair, representing large financial operations, and the public health administration of the Privy Council, which should be essentially a medical affair, and represented the power of only a small purse. It is not to be wondered at that the Poor Law Board gained the mastery, and the Local Government Board in consequence represented the result of this struggle in the comparatively insignificant position assigned to medical experts of the Board. Acts of the Board were to give legislative effect to the recommendations of the Royal Sanitary Commission, and a series of Acts were passed which need not be recapitulated here; but the climax was reached in the passing, by Mr. Sclater-Booth (afterwards Lord Basing), President of the Local Government Board in Mr. Disraeli's ministry, of the consolidating Public Health Act of 1875, which included the results of all recent public health legislation. In the passing of this Act it cannot be said that in the House itself medical men played a prominent part. The work was essentially the work of laymen founded on the expert evidence of Sir John Simon for the Local Government Board, and of a whole host of medical witnesses to the various Royal Commissions that had led to the creation of the Board.

ARE MEDICAL M.P.'S REQUIRED?

This brings us to the question whether, indeed, the needs of government require the direct representation of medical men in the House of Commons at all. It is obvious that the profession has never been represented by those whom it would itself have chosen to represent their views either in or out of Parliament.

Indeed, one may say that the best representative of their views of recent years has probably been the late Lord Playfair, who, although a distinguished chemist, was never a medical man. Why, indeed, is it that lawyers are so largely represented in the House? Is it a question of mere professional ambition? Obviously it cannot only be that, for their very numbers in the House in proportion to the total numbers of their profession must show that they are found peculiarly fitted to represent the interests of the public at large in Parliament. Indeed, the lawyer will say that it is his business to represent all interests of whatever kind in the courts, and I think it is within the experience of most of us within this room—it certainly is within that of most consulting physicians and surgeons and of medical officers of health—that the power of an eminent barrister to master the technicalities of an intricate scientific case are quite marvellous. It is true that the barrister does not usually master them in such a way as to be able to take his part in a scientific discussion on the general problem; but for the practical purposes of his case he will, after a single night's work with a couple of text-books and a consultation with a couple of experts, be able to hold his own as regards that particular case with any evidence, expert or otherwise, in the world. On the other hand, if there are lawyers who will thus master the case on one side, there are also lawyers who will master it with equal ability on the other; and even the judge is often unable to decide between the two, or decides wrong.

Besides, the truth often comes out only after many years, as the result of expert work. Here, then, is the need for medical men, as such, in Parliament. It is the need not for an expert witness, but for a guide to the House to decide between expert witnesses. However expert the medical Member may be, the House will say that his evidence is only his own personal opinion. But if with the experience that he brings to bear he can show reason for leaning to one expert opinion rather than to another, on the principle of setting a thief to catch a

thief, then he will be filling a position which no layman can fill in Parliament.

The influence, however, of the medical man in Parliament is bound to depend far more upon his personality than upon any amount of professional merit. Our own appointments bring us in touch with our local parliaments—mine, for instance, with the County Council of Hertfordshire; and in the proceedings of those bodies and of their committees one has a reflection of the proceedings of the House of Commons. It makes little difference what degrees the medical man has. He is a doctor and his evidence is *prima facie* a fact to be disputed or not by other doctors, regardless of their qualifications, and his conclusions to be adopted—well, that is sometimes a question of votes. In the end the electorate must decide.

It was to my mind significant that when I first discussed with the clerk of the county council the conditions of my present post and pointed out my lack of experience and total inability to do justice to a position of such importance, as compared with the many dozen candidates who would reply to an advertisement of the vacancy, his answer was that he knew my meaning only too well; if the council advertised, there would be 100 applications within a week, and many from men with long strings of letters after their names; the choice of the council would fall perhaps on the one with the greatest number of letters and an unpractical and unbusinesslike appointment would probably result. In other words he preferred, and those for whom he acted on the county council preferred, to choose a man by his personality, or, as in my case, by his stake in the county, rather than by his knowledge.

Since then I have had six years' work for this local parliament, and it has become evident that results are achieved by the gradual education of the authority and by often agreeing passively to things of which one may scientifically disapprove, in order to get what one wishes by a side wind. The essential thing is to size up the personality of the councillors according to their relative value; to deal with every one as occasion may serve, but more especially with those of the greatest influence; to work on their minds from their own points of view and not from yours; and to take their petty economies with a good grace. If this is done in the county council it is so in Parliament. Until Sir Wm. Church was elected on the Herts County Council a month

ago there was not a single medical man upon it; but I would far rather that were so than that there had been some inadequate representative, to whom the council would have been compelled to defer rather than to their own medical officer. So is it in Parliament. I do not think that we need very much deplore the absence of medical men in Parliament unless we can get the best, and by the best I mean the shrewdest and those with the greatest proportion of common sense.

OPINION OF THOSE CONCERNED.

But if we can get good men of this calibre to enter Parliament and become living members of the parliamentary profession, and not mere interesting anomalies in their midst for a few years, then it would seem that the influence such men might exercise would be of unique value. The experience of those actively concerned in the medical representation in Parliament may be of value. In 1899 the late Sir Richard Thorne Thorne, then Medical Officer to the Local Government Board, entered sympathetically into my scheme for taking up a parliamentary future as a definite speciality in the profession. He said that whenever any question of public health came before Parliament on which it was desired to have medical opinion, it was necessary for them to ask one of the medical Members of the House to come over to the Board to be definitely instructed into the facts of the case. None of them, as he pointed out, had had any professional experience of public health work; and those who are concerned in the work of preventive medicine know how totally different is the aspect of that to the curative side of the profession.

Sir Richard Thorne Thorne advised me therefore to study public health from every possible point of view; to study it abroad, to study it throughout the empire, to study it in our town and in our country districts, in order to be cognisant of the field of questions likely to come before Parliament and to know where to go for the latest information on the subject. Above all it was necessary to undertake responsible work in the machine of sanitary administration in order to have had direct experience of the difficulties that arise in carrying out measures, however excellent they may appear as they are put in the statute book.

When I first took up the idea of training for eventual parliamentary work it was my good fortune to have the personal advice of the late Sir J. Burdon Sanderson, of Professor Arthur Thomson, and of one or two other of my

teachers. Only two or three years before his death Sir J. Burdon Sanderson, when discussing this matter at length, asked, "What is it, then, you wish to do? Do you wish to become an expert? If so, you should go abroad for five years and undertake research work in some particular branch of your subject that may be of permanent value." "Not a bit of it," was the reply of another of my advisers to whom I related this conversation. The expert, as he pointed out, is known as an expert, and his opinion on every matter, except the minute field of his special experience, is considered as of less value than that of the average layman. And rightly so. The research worker in a laboratory is a hermit. His field of experience is very small, and the further he goes into his own subject the less sense has he of its proportion to life as a whole; and if a mere research worker were to enter the House of Commons, however important his work on opsonins and spirochaetes might be, it would be difficult for us in our profession to consider him as useful a representative as a man who had engaged in work in contact with his fellow creatures outside the profession.

Then I may quote the opinion of two of the chief medical representatives in Parliament in recent years.

"In the first place let me say," writes one, "Parliament is no place for doctors at present. There is a strong prejudice against the profession, as they are always suspected of playing for more power, etc. Lord Playfair (although only supposed to be a medical man) complained of the same feeling, as stated in his life by Wemyss Reid. So if you go into Parliament you must be content to be a private member, and do, as opportunity offers, work in connection with public health; but if you strike out into general politics you will be more or less tabooed as 'only a d—d doctor.'

"I think medical problems must more and more attract the attention of Parliament, because there is no step in social legislation in which medical questions do not arise. The Ministers who pilot these measures through Parliament are mostly ignorant of public health, but they are crammed by their official experts, and, as you know, such men are very impatient of criticism. The medical man in Parliament is therefore at a disadvantage, as he is regarded by the politician trying to push his Bill through as an impediment to rapid progress, and as one more or less actuated by a desire to help his cloth. You and I know this is a very wrong

view, but it exists, and damages the usefulness of a doctor in the House."

Another of different political views takes the same line:—

"As a matter of fact doctors are not liked in the house and are sat on. Michael Foster and I tried to get a Medical Committee formed, but it has never done much good. At the general election I was opposed by a layman, who was supported by the *Lancet*, which expressed itself to the effect that it saw no special reason why a doctor should represent — any more than the editor of a paper."

THE PARTY SYSTEM.

A year or two ago, after he had crossed the floor of the House of Commons, and a few months before he was turned out at the general election of 1906, the late Sir Michael Foster kindly asked me to spend a day at his place near Cambridge to talk the whole matter over. One of the first things that he emphasised was the need of a medical member attaching himself definitely from the first to one party. He recognised how much he had lost by his own change of front. He had been urged into the House of Commons by his friends in order that he might express the opinions not only of medicine but of the scientific world, as for so many years Secretary of the Royal Society and Professor at Cambridge, and it was only in small degree that he considered it necessary to form any decided opinion with regard to the great questions that divided the parties of the day. It was the khaki election, and was mainly fought upon the continuance of the South African war, which resulted in an otherwise somewhat unnatural majority for the party then in power. Indeed, to the Unionist party he had special attachments through his intimate friend at Cambridge, the great comparative morphologist, Francis Balfour, brother of the Unionist leader. While readily listened to, however, in the House of Commons on medical subjects, he felt his mind more in sympathy with the growing Liberal feeling that culminated in the surprising change at the last General Election, and he felt it his duty in 1903 to join the other side. In so doing, however, he felt that he had not only incurred an immense amount of personal inconvenience, but that he had lost very largely in power in the House.

This, indeed, seems inevitable from a consideration of party government. You may be right or you may be wrong in deploring the party system, just as you may be right or you may be wrong in pointing out the waste of

energy between stroke and bow side in an eight-oared boat. But as matters stand, and as they are likely to stand for a considerable time to come, parties, and therefore members, stand and fall with their political platforms; the motto of Parliamentary work is "Union is Strength." The party agree to support certain measures in the same way as the soldier agrees to support the general interest of his country in a campaign planned by his commander-in-chief. Just as it would be impossible for a single soldier or a single officer, however highly placed, to take his individual line in the field, or for any oar in the boat to row his own time regardless of stroke, so is it useless for any individual man to think of playing a prominent part in Parliament unless he becomes a loyal adherent of one of the leading parties in the House.

MEDICINE REPRESENTS SCIENCE.

This, I think, is especially the case at the present time with the growth of scientific knowledge. Medicine is qualified to represent the whole of science because she works on the borderland between scientific facts and humanity.

She concerns herself with the play of scientific affairs on mankind. She is accustomed to think scientifically but to practise humanely, and therefore is she peculiarly fitted to appreciate scientific progress in every kind and branch of learning, and to interpret and expound it to the layman. Medical men, indeed, should be the prophets of scientific knowledge and method to Parliament and to the whole nation.

It must strike everyone, and especially those members of our profession who are concerned in the wider studies and operations of preventive medicine, that science is playing and in the future is bound to play a gradually increasing part in the work of every profession and every calling in life; and it is for this reason that well-equipped exponents of medical and sanitary science are required in Parliament. For the medical man has this further pull over other exponents of modern science, that he deals with things of vital importance to every individual; interests that appeal to the heart as well as to the mind of every public man.

THE MEDICAL WORK OF PARLIAMENT.

Let us consider, then, for a brief space the points on which a medical man should give evidence and the opportunities he will have for

exerting his influence in the House. Take an ordinary list such as I have here of the public Bills of any one session. I have analysed, roughly speaking, the 289 public Bills introduced into either House of Parliament this session, and of these it would seem that on 141 there is need of definite medical opinion; in other words, that one-half of the public Bills introduced into either House in some degree or other require medical evidence for their solution. In addition to public Bills are 35 Provisional Order Bills, 20 confirmation Bills, and 134 private Bills, a large proportion of the latter dealing with water, sewage and other works of public health. It would seem advisable, therefore, that a medical man shaping his career from the first with a view to the House of Commons should be an expert in public health. Not only does this work cultivate the habit of thinking in masses and dealing with them, but it is with that side of medical work that he will be more particularly confronted and must be competent to deal, as the mere therapist can seldom be. Moreover, through dealing with public health work, the principles of which are generally accepted in all quarters of the House, and the opposition to which is mainly a question of vested interests, soluble only by time and experience, he will have acquired influence in settling matters that deal with the particular questions affecting the medical profession, either individually or as a whole.

On this point a caution is required. If a medical man goes in as a representative of his profession he is looked upon at once as being a trades-unionist, battling for the rights and privileges of his profession; and if he is known in that capacity by the rest of the House his influence will be comparatively small. Although at one time I thought that a man should be supported directly by the British Medical Association, I am now firmly convinced that he should maintain an official independence from that and all other organisations for medical defence; and when questions of medical privilege are raised should work as much as possible behind the scenes beforehand, and in quiet; for by the time a matter has reached the stage of public debate it is probably past mending. I think it may be for lack of this policy of moderation in defending professional rights that certain medical representatives in the House have failed to gain the influence in general medical questions that was expected of them.

THE APPEAL TO MEDICAL MEN.

Lastly, I would urge you, gentlemen—you who are in touch with the local public life of the nation—to encourage young men of the right stamp to prepare themselves to become specialists in parliamentary medicine, and in due time to enter the House. At the public schools and universities there are many men who now are, or at some future stage in their lives may be, possessed of private means which will place them above the necessity of earning their own livelihood. There are many such men who, on completing their educational career, are hard put to it to choose a profession or an occupation in life. After a year or two of idleness they perhaps travel round the world and read for the Bar, and when it comes to taking their part in local government in the neighbourhood of their paternal property, or in public affairs elsewhere, they begin to wish that they had some experience which would raise them above the level of their fellows. It is easy for us to see what an enormous advantage such a man would have, had he been through only the pass schools of medicine, and qualified as a medical man. I think this possibility should be definitely pointed out by all those that have an opportunity of advising fathers as to the future of sons who may eventually be in a position to stand for Parliament. We know further that those whose necessities in life are already provided for will find few discomforts and a very large number of advantages from their hospital career at the stage when a man above all wants to be engaged in definite work, and to be associated with his fellows. The hospital life gives him a source of interest and associations which cannot fail to stimulate his whole life. He not only acquires knowledge, but he learns the responsibility of life and death. He not only learns to face every problem with which he is confronted by accurate diagnosis and a statement of facts, but he learns how to take a life in his hands and deal with it with the best means at his disposal; to recognise its weakness, to make use of its strength; and to look to the after results in life or on the post-mortem table, in order to confirm the correctness of his work and the accuracy of his diagnosis, with the view of doing better next time. It is this orderly habit of thought, unique experience and grave responsibility, shared only, I should say, by a sailor on duty or a soldier on active service, that in the words of one of my most distinguished contemporaries in the Oxford

schools, makes the medical profession the best all-round training for any man of affairs.

Mr. Rudyard Kipling a fortnight ago, in a unique address for the opening of the session at a medical school, showed a true appreciation of the actual position held by medical men in the public eye. "They had been exposed," he said, "and always would be exposed, to the contempt of the gifted amateur—the gentleman who knew by intuition everything which it had taken them years to learn. They always would be exposed to the attacks of persons who considered their own undisciplined emotions more important than the world's most bitter agonies: people who would hamper and cripple research because they feared that research might be accompanied by a little pain and suffering."

"But their work went on, and would go on. They remained now perhaps the only class which dared to tell the world facts—that if fathers had eaten forbidden fruit the children's teeth were liable to be affected, and facts of that nature. Their training shewed them daily and directly that things were what they were and their consequences what they would be, and that people deceived nobody but themselves when they pretended otherwise. Better still, they could prove what they had learned."

The Regius Professor of Medicine at Cambridge, Sir Thomas Clifford Allbutt, speaking to the Manchester School the other day on "Medicine and the State," concluded with the following typically English outburst of pessimism:—"Unrepresented by its own minister in Parliament, by alien ministers it was alternately used and betrayed; and in silence must submit to hear its motives misinterpreted, its methods mishandled, and its unrequited labours imposed upon."

THE APPEAL TO THE SOCIETY.

Gentlemen, it is the privilege of the Fellows of our Society to serve the public communities of the nation in a capacity of exceptional and growing importance to its most vital interests, yielding to others the greater share in public recognition and reward, but yielding to none in the loyalty and patriotism of our service, in the thoroughness of our work, in the courage of our advice. But we fail in our duty to the nation if we do not endeavour, and succeed in the endeavour, to make our voice heard in the counsels of the nation. It is not enough to advise our local authorities how to act; nor even by lectures and addresses and writings to play a part in the education of the public. We must play a direct part in the election of suit-

able representatives to the Imperial Legislature and a direct part in the course of that Parliamentary procedure, which stimulates or narcotises the work of all Government offices and all public authorities throughout the United Kingdom; which exerts a strong influence on the whole British Empire, and is a power for good or evil in the progress of every nation in the world. Every medical man, every medical officer of health, is a man whose opinion would be gladly listened to by the Member of Parliament and by rival candidates in the constituency in which he lives and works. Let us, then, the guardians of the public health, make for ourselves opportunities, and use them well, both independently and by concerted action, wisely, quickly, firmly, to make our views known, our experience used, and our influence felt by the Parliament of the British Empire, the mother of the Parliaments of the world.

BORIC ACID IN SAUSAGES.—On June 11th Mr. Robert Wallace, Chairman of the Middlesex Sessions, delivered judgment in the appeal of George William Hayward, of Market Street, Shepherds' Market, Mayfair, against a conviction by Mr. Mead, sitting at the Marlborough Street Police Court on December 11th, 1908, and a fine of £5 5s. and £2 costs for having unlawfully sold to Alexander McNair sanitary inspector to the City of Westminster, a pork sausage which was not of the nature, substance and quality of food demanded by the purchaser. It was stated that the sausages contained 22·4 grains of boric acid to the pound. The appellant contended that the practice was common in the trade and essential to preserve the sausages. Mr. Wallace found that the sausages were sold to the prejudice of the purchaser; that they contained something that rendered them not of the nature, substance and quality demanded by the purchaser. With regard to the proviso in Section 6 of the Sale of Food and Drugs Act, 1875 (under which the proceedings were taken), the boric acid contained in the sausages was not an ingredient required for the production or preparation of the food as an article of commerce. The quantity, however, in the purchase by the witness was not, he found, injurious to health, but the purchaser would be prejudiced, in that he would not, Mr. Wallace thought, buy the sausages if he knew of the presence of boric acid, in view of the evidence called before him that there was at least a possible danger from such purchase. The appeal was dismissed with costs. Mr. Wallace said that he was willing to state a case for the High Court if it was required.

HEALTH, RATES AND HOUSE RENTS.

By B. G. BANNINGTON, Cert. San. Inst.,
Sanitary Inspector, West Ham.

IT is frequently asserted and widely believed that the cost of improved sanitation is paid by householders, especially those of the working class, by means of an increased rent. The very plausibility of the statement disarms suspicion of its truth and almost ridicules enquiry. To the unthinking it seems to be almost a law of human nature that a house-owner should tack sixpence or a shilling per week on to rent because he has been compelled by the sanitary authority to make his houses habitable, or because of an increase in rates due to improved hospital accommodation, street cleansing, water supply, refuse removal and disposal, or other municipal activities that improve the health and amenity of a district; and his power is taken to be equal to his desire.

Both ideas have alleged instances to support them. Owners often give the health officer's visit as a reason for increasing the rent, and exponents of so-called "economy" loudly proclaim that "increased rates must cause an increase in rents." One serves as a threat to keep the Sanitary Inspector out of the house, the other as an argument to keep an opponent off the council.

Such assertions are very difficult to disprove; the general statement that rents are falling, or have fallen during a given period, gains much less credence than individual instances to the contrary, especially if these cases affect those appealed to. The personal, the immediate, and the known have much more weight with the average man than the general, remote, and unknown; he likes concrete cases, and these, carefully chosen and sedulously reiterated, effectually counter the true statement made in general terms.

The difficulty always lies in proving the general statement by showing figures relating to rents. Until each local authority is required to make a survey of rents and record changes at regular and fairly frequent intervals there will be no official figures available. It would be futile to expect house-owners to voluntarily publish details of their business, which in many cases would expose them to public censure and it might be to official re-assessment. Fortunately the Outer London Inquiry Committee, in dealing with the social and industrial

condition of West Ham, expended no little labour in collecting and arranging statistics showing the movement of rents in that borough. Thus, whilst implicitly indicating one of the many gaps in our statistical knowledge, they have secured and published figures relating to rents in the borough as a whole, and in several of its wards separately, that form an admirable and adequate basis for a comparison with figures culled from official reports which show the action taken and improvement made in the sanitary condition and health of the borough.

With such figures available, and at a time when every effort to arrive at the truth in matters of sociological importance is of value, no apology is needed for an attempt to fill one of the vacant spaces in our daily increasing knowledge of social conditions and causes.

The inquiry, so far as the effect of health administration upon house property is concerned, must of necessity be somewhat limited in time, for whilst the figures dealing with rents extend from 1888 to 1905, those for sanitary administration are only really valid since 1898. The reason for this is that at the end of that year the sanitary staff was increased and reorganised, house-to-house inspection became a settled policy of the Council, and at the same time the West Ham Corporation Act, 1898, came into force, and work requiring much outlay has been carried out under its provisions. The figures for 1897 and 1898, where available, have been added for comparison, and, though inadequate, rather increase the force of the argument here set out.

TABLE A.—SANITATION AND RENTS IN WEST HAM,
1897—1907.

Year.	Houses Inspected.	Nuisances Found.	Notices Served.	Drains Relaid or Repaired.	Complaints Received.	Death Rate.	Infantile Mortality.	Rents.
1897	—	15,898	—	1,306	—	18.4	169	7/4
1898	—	15,152	5,484	934	—	18.3	167	7/7
1899	9,298	36,750	9,436	2,341*	3,967	20.3	196	8/0
1900	7,901	30,998	7,534	1,785	2,938	19.6	188†	8/2
1901	8,688	28,097	7,966	1,943	2,703	18.2	168	8/1½
1902	9,016	28,955	7,779	1,888	2,276	17.3	144	8/1
1903	10,210	27,926	7,310	1,914	2,153	15.5	142	8/3
1904	10,215	25,288	7,147	1,701	1,808	16.7	158	7/4
1905	11,397	26,037	7,144	1,562	2,134	15.5	148	7/2
1906	13,226	26,464	6,684	1,404	2,450	15.2	138	still
1907	13,737	26,263	6,687	1,021	2,102	14.5	123	fall'g

* West Ham Corporation Act, 1898, came into force.
† Two health visitors appointed at end of 1899.

In Table A are set out figures relating to the administration of the Public Health and kindred Acts by the sanitary department and showing the results in the columns containing the rates of general and infantile mortality. These are

placed alongside figures relating to rents in order to determine what relation, if any, the sanitary condition of the houses has to the rents charged for them. The rental data ends with 1905, but it is a matter of common knowledge that the downward tendency of rents has not yet exhausted itself.

Column 1 gives the number of houses inspected by the staff of the health department for each of the years 1899 to 1907. At the end of 1898 the inspectorial staff was increased to thirteen (including one lady Inspector dealing with laundries, women's workshops, etc.), the borough was divided into twelve districts, each with a male Inspector in sole charge, subject to the supervision and direction of the Medical Officer of Health, and the West Ham Corporation Act, 1898, coming into force made it possible to secure many improvements, notably as regards drains, hitherto difficult or impossible to obtain. Late in 1899 two Health Visitors, a Food and Drugs Inspector and a Shop Hours Inspector were appointed, and completed the inspectorial staff as it exists to-day. The figures from this date (end of 1898) are reliable; the work done has been fairly distributed over the whole borough, and is therefore valid for comparison with figures showing fluctuations of rent.

The number of houses inspected in 1900 is considerably less than in 1899 in consequence of the vast amount of work required in the latter year occupying much of the inspectors' time in supervision. The numbers then gradually rise, until in 1907 there were nearly 4,500 more houses inspected than in 1899, an increase of roughly 50 per cent.

The next column indicates the total number of nuisances found and dealt with each year. These do not all occur at dwelling-houses, but are still a fairly safe indication of the amount of repairs and renovations secured therein. As would be expected, a considerable increase (over 100 per cent.) takes place in 1899 over the figures of the previous years, but then a gradual downward movement sets in until in 1807 there are 10,500 less nuisances found and abated than 1899. Taken in conjunction with column 1, these figures show that whereas in 1899 about four nuisances were found for each house visited, by 1907 the number of nuisances had fallen to less than two per house, a clear and conclusive indication that the general sanitary condition of house property had been considerably improved.

The third column shows the number of

statutory notices served for the abatement of nuisances, and, like column 2, is not confined wholly to dwelling-houses, but is reliable for comparative purposes. These figures closely follow those in the previous column; the average number of nuisances per notice served is about the same in 1899 and 1907, but 1899 shows more notices served than houses visited, whereas in 1907 only about one notice was served for every two houses inspected. Compared with column 1, which shows a 50 per cent. increase in the houses visited, these figures show a decrease of about 33 per cent., and corroborate the conclusion that house property is much more comfortable and healthy than at any previous time.

Column 4, showing the number of drains repaired or relaid by order of the sanitary staff, is given as roughly indicating the amount of work done to remove one of the most serious sources of nuisance and ill-health, and requiring more expenditure, item for item, upon the house-owner's part than any other nuisance or defect. The decrease is not so even as in the previous cases, as unlike most nuisances, faulty drains when once properly remedied do not again require attention; consequently the increase shown in 1901 and 1903 may be traceable to the visitation of property in 1900 and 1902, where the drains were originally well constructed or had been put into good order previous to these years. It must be noted that figures for drainage or other nuisances found give no clue whatever to the expenditure incurred in abating them; it might be necessary to relay a drain from the offices at the rear right under a house to the sewer in front at a depth of perhaps six feet, or it might only be necessary to remake a cement joint at a depth of six inches. The length, depth and diameter of a drain, its position as regard the premises, the number and complexity of its tributaries, the nature of the soil, and the type of workman employed will all affect the cost, so that assuming that the 1,021 drains dealt with in 1907 were relaid (which is incorrect) it is possible that the work cost more to execute than did the 2,341 drains in 1899 under a similar assumption. The value of these figures is in the indication they give of the improved sanitary environment of the people of West Ham.

In column 5 the number of complaints received and dealt with by the Health Department are tabulated. Again the figures show an enormous decrease, nearly 50 per cent., comparing 1907 with 1899, and this in spite of

the fact that the lady Inspectors receive many complaints when visiting new-born babies, cases of measles, or for other special purposes. Another factor tending to retard the decrease is the increasing recognition by the people that their complaints, many of which are verbal, will be attended to and their confidence kept. With this knowledge it can safely be asserted that the decrease in the number of complaints is a sure indication that the causes of complaint have diminished.

To conclude the data as to the sanitary condition of West Ham, in columns 6 and 7 are tabulated the general and infantile death rates. All administrators of the Health Acts hope and expect to see a diminution in these figures as a result of their efforts to remove the causes of disease and death. It is, however, being more and more realised that the great "condition of the people" question, the "social problem"—poverty and ignorance in the mass—set a limit to the results that might be obtained by health administrators. The extent to which death rates are affected by poverty and ignorance is not yet determined, but it must be great; it is therefore satisfactory to find that in West Ham, which has more than its share of these malign factors, the general death-rate, after increasing in 1899, has fallen from 18.4 per 1,000 in 1897 to 14.5 in 1907, and that the infantile death-rate has been reduced from 169 per 1,000 births in 1897 to 123 in 1907. Both indicate a considerable saving of life, and it may reasonably be assumed a corresponding increase in general health.

In the next column are set out the figures relating to the rents of cottage property in the borough of West Ham from 1897 to 1905. These are derived from "West Ham: A Study in Social and Industrial Problems," in which the results of the first investigation of the Outer London Inquiry Committee are published. The figures are based upon data dealing with a number of houses varying between three and six thousand, and are believed by the authors "to be a fair sample from which to deduce the conditions of cottage property as a whole," and "to represent the actual variation in conditions."

In "West Ham" the figures showing the average weekly rents are given for quarterly periods. Commencing with the first quarter of 1897, at an average of 7s. 4d. per week, they gradually increase until 1901, when a tendency to stability lasts until the first quarter of 1903, when the maximum of 8s. 4d. is reached,

followed by three quarters at 8s. 3d. and then by a sudden fall to 7s. 5d., which heralds a gradual decrease for the rest of the period down to 7s. 2d. The figures tabulated for each year are the averages to the nearest ½d. of the quarterly figures given by the Inquiry Committee. It must be noted that the increase in rents commenced at least two years before the reorganisation of the Public Health Department. The Committee sum up their observations, which commenced from 1888, the year West Ham became a county borough, with the statement that "the variation in rents is from 7s. 2d. in 1888 to a maximum of 8s. 4d. in 1903, with a minimum of 6s. 9d., which was most marked in 1891. Rents appear to have fallen considerably since 1903. . . . During the whole period rents had first risen and then reached the level at which they started." In the opinion of competent observers this decline in rents has continued to the present time.

It is now possible to formulate a conclusion based upon the data set out and explained. It is true that the conclusion must be of a provisional character; the evidence covers only a brief period, and, although derived from an essentially working-class area, may be modified by influences which investigation in other districts might show to be important. It does prove, however, that whilst the sanitary condition of the cottage property in the County Borough of West Ham has undergone a very marked improvement, a very obvious decrease in rents has taken place. The organization of the public health service is more perfect, the supervision of the hygienic environment is more thorough, the number of houses visited each year is greater, the nuisances found are fewer and less serious, and, as a result, the death-rates, general and infantile, have fallen, and have not been accompanied by increased rents. West Ham is a healthier place to live in; the average householder can secure more comfort and convenience and better health to-day than he could ten years ago, and has to pay, not more, but less rent.

The report upon West Ham estimated the fluctuations of rent in several of the twelve wards of the borough, and thus made it possible to compare the sanitary conditions with the rents obtaining in a more limited area—the Hudson Ward. This ward is almost identical in area with one of the twelve districts into which the borough is divided for the purposes of health administration; a few streets included in the ward but excluded from the district on

one side are balanced by a small area excluded from the ward but included in the district on the other side. The figures set out in Table B have not been separately published, being included in the general figures for the borough given in the Medical Officer of Health's annual reports, the writer (who has personally done the work and collected the data) being indebted to the Medical Officer of Health for permission to use them.

TABLE B.—SANITATION AND RENTS IN HUDSON WARD, WEST HAM, 1899–1907.

Year.	Houses Inspected.	Nuisances Found.	Notices Served.	Rents.
1897	—	—	—	7/3
1898	—	—	—	7/4½
1899	752	3,765	972	7/7
1900	757	2,348	850	9/2
1901	802	2,896	862	8/2
1902	794	2,085	800	8/4
1903	1,051	2,085	733	8/1½
1904	966	2,072	690	8/0
1905	1,266	1,783	719	7/5
1906	1,184	1,733	593	still
1907	1,274	1,953	595	falling.
1908	1,281	2,134	656	

Column 1, giving the number of houses inspected annually, shows that the number has increased by two-fifths. Column 2 exhibits a 50 per cent. decrease in the number of nuisances found, giving an average of five nuisances per house inspected in 1899, which falls to less than two per house in 1908. Column 3 corroborates the previous figures in showing a continuous and marked improvement in the sanitary condition of the district. In 1899 there were over 200 more notices served than houses inspected, whilst in 1908 there were only half as many notices served as houses inspected. The number of nuisances per notice remains about the same as in 1899. It is perhaps necessary to point out that these figures tend to be complementary, inasmuch as the more nuisances found and the more notices served the more of the Inspectors' time is taken up with clerical and supervisory work and the less time can be devoted to house inspection and other various and not less important duties. The figures for this district are in striking harmony with those for the borough as a whole, and prove it to have experienced its full share of the general sanitary improvement.

In column 4 the average weekly rents, based upon the quarterly observations by the Inquiry Committee, of between 250 and 1,200 dwellings are set out. Commencing at 7s. 2d. in the first quarter of 1897 they gradually increase to 7s. 9d. in the last quarter of 1899, and then

in the next quarter suddenly jump to 9s., reaching a maximum of 9s. 2d. in the last quarter of 1900, and then declining to 7s. 5d. in 1905. The decline has continued, and it is almost certain that to-day the rents would be at a figure equal to, if not below, the 7s. 2d. at which they stood in 1897. These rents, and those for West Ham, are shown as curves for the whole period 1888–1905 in Diagram 1.

This table tells the same tale: the sanitary condition of the houses has improved and rents have decreased.

So far as West Ham is concerned there appears to be no evidence that improvement in the sanitary condition of cottage property has to be paid for by the tenants in higher rents. The further question presents itself: "What relation exists between rates and rents?"

Concurrently with the hygienic improvement of the homes great progress has been made by West Ham since it became a borough in 1888 towards the realisation of the many benefits to be derived through collective effort. Especially has this been the case since 1898, when the temporary success of the Socialist and Labour Party at the polls brought against them in municipal politics a new organization (the Municipal Alliance) with new and younger men having more progressive ideas than those supplanted by the Labour Party. Transit has been facilitated by improved and wider roads and a complete system of electric trams; public baths have been established, recreation grounds opened, and libraries and a museum built and equipped. Bands provide music in the parks in summer and occasional free concerts offer entertainment at the public halls in winter. A splendid system of education—elementary, secondary and technical—has been established; much money has been spent in providing for the infectious sick and the mentally deficient; and by the provision of cheap electricity for lighting and power much has been done to stimulate industry and to purify the atmosphere. It follows that the general amenities of life in the borough have considerably improved. It is now a far more desirable place to live in than it was ten years ago, and it would not be very surprising if it were found that rents had increased as a consequence. Most of the improvements enumerated are of common benefit and have to be paid for out of the common purse, *i.e.*, the rates, an increase in which may therefore reasonably be expected.

It is not, however, intended to discuss the causes of the high rates levied in West Ham; the point to be determined is, Are increased rates necessarily followed by an increase in rents? To this end the rents given in "West Ham" for the whole of the borough from 1888 to 1905 are shown as a curve and accompanied by another curve indicating the fluctuations in the total rate levied in the borough. It will be seen that rates which commenced in 1888 at 5s. 10d. in the £ fell to a minimum of 5s. 4d. in 1889, had doubled when the maximum of 10s. 8d. was reached in 1905 and then decreased to 9s. 7d. in 1907.

Rents, which are based upon quarterly returns of houses varying in number from just under 1,000 to 6,000, commence at 7s. 2d. in 1888, fall to a minimum of 6s. 9d. in the second quarter of 1889 and middle quarters of 1891, then rise to a maximum of 8s. 4d. in first quarter of 1903, and then drop to 7s. 2d. in 1905, and are still falling.

If rates affect rents a rise in the rent curve may be looked for after a rise in the rates. Comparing these curves a slight sympathetic rise in rent is noticed to follow the increased rate of 1888 and a similar decrease in rent accompanies the reduction in rate in 1889, but rents rise again six months before the next and increased rate is made, a similar effect being seen in 1891. For the next six years, whilst rates rise from 5s. 8d. to 8s. 5d. in 1895 and then fall to 7s. 8d. in 1897, rents are practically stationary at about 7s. 3d., although the fall in rates in 1897 seems to be very briefly reflected in a fall in rents. Henceforth the curves of both are upwards, but rents precede rates, not follow them, showing a tendency to decrease in 1901 when rates still increase, and attain their maximum in 1903 when rates tend to decrease. Then in three years rents fall from 8s. 4d. to 7s. 2d. in 1905, whilst rates are 10s., 9s. 10d. and 10s. 8d. in the £. Rents finish in 1905 at 7s. 2d. per week, exactly the same

DIAGRAM 1.

RENTS AND RATES IN WEST HAM, 1888-1907.



figure as in 1888, whilst rates are 10s. 8d. in the £, or nearly double what they were in 1888.

Clearly there is here no evidence of a necessary relation of rents to rates. The authors of "West Ham" assert that "a comparison of increases in rent and rates is, in the case of West Ham, rather misleading, because the increases are out of proportion." But it is exactly because the variations have neither proportion nor connection in time that the comparison is valuable as showing that fluctuations in rates have not the effect upon rents that is so commonly believed and asserted.

A similar curve for rents in Hudson Ward is even more instructive. The rise in rates from 5s. 4d. in 1889 to 8s. 5d. in 1894 has no effect upon rents until 1895, when rise is sharp and rents then remain fairly level in face of decreased rates, rising again very sharply to a maximum of 9s. 2d., when rates are 9s. in the £ (1900) and then, in face of rising rates, falling rapidly to 7s. 5d. in 1905, when rates are 10s. 8d. In 1889 and 1893 rents stood at about the same level but rates were 5s. 4d. and 7s. 2d. respectively. Rents were about 7s. 5d. in 1897 and 1898, when rates were 7s. 8d. and 7s. 10d., and in 1905, when rates were 10s. 8d. in the £. Here, again, there is no evidence to justify the popular belief.

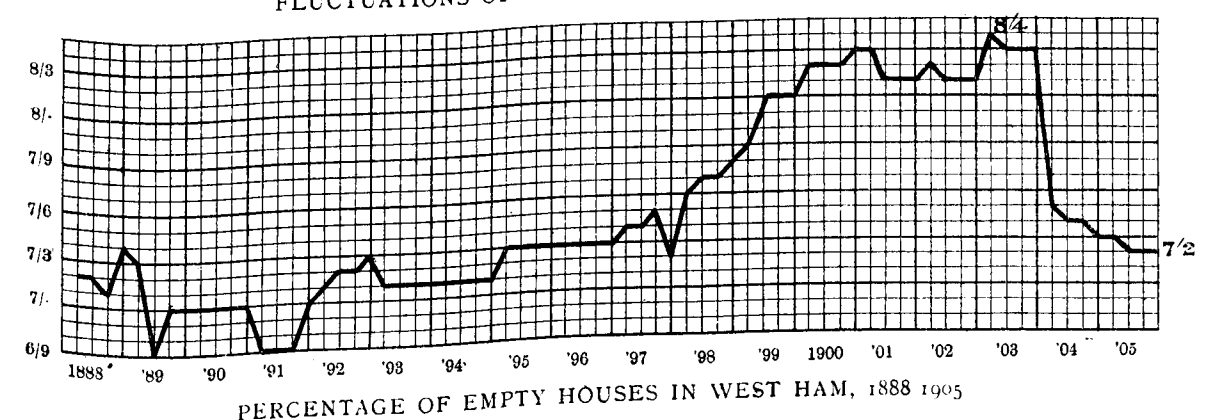
From the data collected and examined it is certain that, within the limitations imposed by time and place, it by no means follows that either an improvement in the sanitary condition of the homes of the people, or an increase in the rates necessary to effect improvement in the civic environment, or both, must inevitably be paid for by an increase in rents.

In West Ham it has been shown that not only are the houses more healthy and comfortable, disease less and the death-rate lower, but the general advantages, economic, educational and social, are greater to-day than was the case when the charter of incorporation was granted in 1888, whilst rents are at about the same level.

Adam Smith asserted in his "Wealth of Nations" that "When two masters run after one man wages rise; when two men run after one master wages fall." Thus the effects of competition in the industrial market are summed up. In opposition to the alleged causes of variations in rents just dealt with it is asserted that when two tenants are after one house rents rise, when two houses are offered to one tenant rents fall. High rents are caused by lack of housing accommodation; competition amongst would-be tenants permitting house owners to demand and secure increased rents. Hence the demand that local authorities should

DIAGRAM 2.

FLUCTUATIONS OF RENTS IN WEST HAM, 1888-1905.



PERCENTAGE OF EMPTY HOUSES IN WEST HAM, 1888-1905.

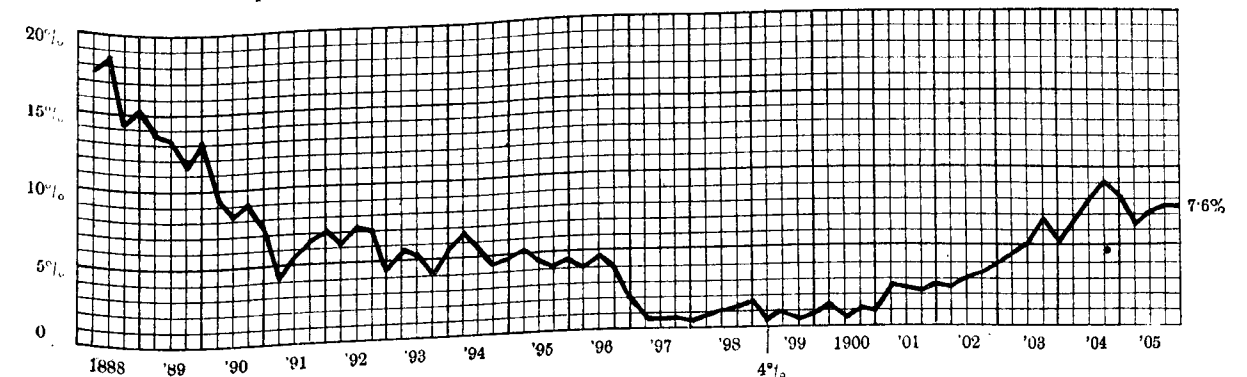
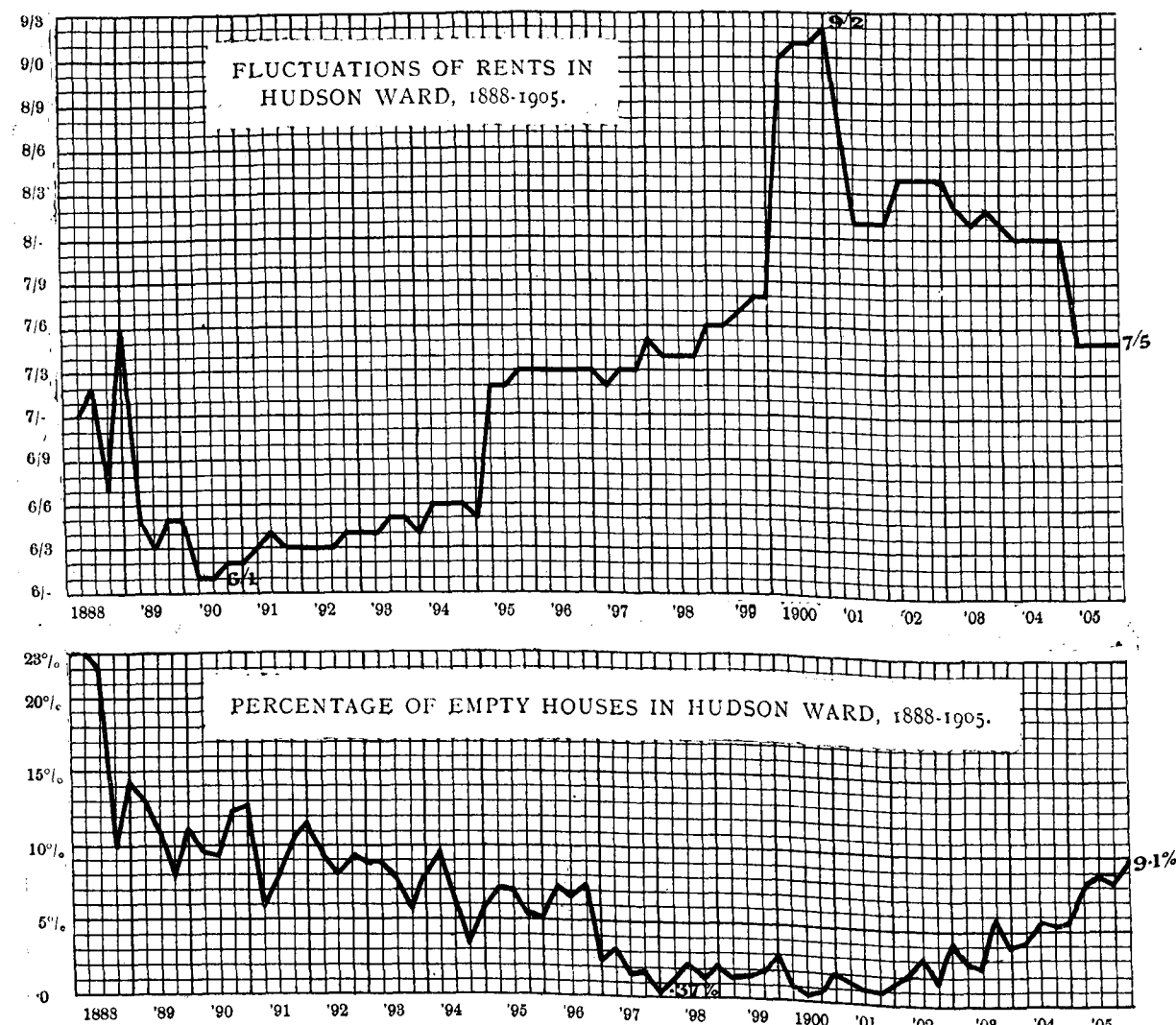


DIAGRAM 3.



use their powers under the Housing of the Working Classes Acts and build houses to increase the supply and so stop the rise of rents. This explanation finds ample justification in the figures for West Ham which the Inquiry Committee secured but did not use to the best advantage.

Accompanying the figures relating to rents in the work quoted from are others giving for each quarterly period the number of houses dealt with and the number of empties amongst them. As the number of houses dealt with varies considerably, the absolute numbers of empties is useless, and have therefore been reduced to percentages of the whole. Bearing in mind the assertion that the facts given fairly represent cottage property in the borough, the percentage of empties has been plotted as a curve below one showing the movement in rents. If the theory enunciated above is correct, the curves, unlike those for rents and rates, ought to form a complete contrast: a rise

in empties should precede a fall in rents, and a fall in empties be followed by a rise in rents.

Comparing the curves for West Ham (Diagram 2) the high percentage of empties, decreasing from 19.6 per cent. in 1888 to 4 per cent. in 1891 is reflected in a low rental rate followed about 1891 by a rise. From 1891 to 1896 the empties are fairly stationary at about 5 per cent., and rents also show but slight fluctuation. From 1897 to the end of 1900 empties remain at about 1 per cent., with a minimum of 0.4 per cent., and the result is seen in a rapid rise in rents, which is maintained until 1904. From 1900 onward the number of empties increase, touching 9 per cent. in 1904 and finishing at 7.6 per cent. at the end of 1905, and here again the effect is shown upon the rent curve by a rapid fall from 8s. 4d. in 1903 to 7s. 2d. at the end of 1905. It is rather significant that the fluctuation of empties about the 7 per cent. mark during the three

years 1890-1-2 should be followed by an oscillation of rents about the 7s. 2d. mark in the following five years, and that the similar movement of empties from 1903 to 1905 should have the effect of dragging rents down to 7s. 2d.

Similar curves for rents and empties in Hudson Ward (Diagram 3) show corresponding results. The somewhat violent oscillations of empties about the 10 per cent. line from 1888 to 1893 is reflected in a fairly stationary rental curve which rises sharply immediately after empties show a definite tendency to fall to 5 per cent. The fluctuation of empties about 5 per cent. is followed by rents clinging about the 7s. 4d. line. Then the sharp fall in empties to a minimum of .37 per cent. at the end of 1898 and a fairly stationary period from 1897 to 1902 at about 2 per cent. is reflected in a rapid rise of rents which follow the increasing number of empties by falling to 7s. 5d. in 1905.

It is to be regretted that the investigators did not explain the very prominent truncated pyramid which represents rents for 1900 in Hudson Ward. They secured data relating to about 150 more houses than in 1899, and these would seem to have been of a better class—probably new—than those previously dealt with, thus exaggerating the rise which the inclusion of nearly 200 more houses in the next year appears to correct. However, that may be the complementary contrasts of the two curves—rents and empties—for this ward, as for West Ham as a whole, seems to prove that a low percentage of empty houses and high rents are related as cause and effect, and that the alleged causes dealt with are practically inoperative.

That high rates, instead of causing increased rents, may have an exactly contrary effect in such a district as West Ham is an aspect frequently lost sight of. High rates are felt by those who have to pay them, and it is, therefore, the occupiers of property above the cottage class who are most affected. To such occupiers an increased rate is equivalent to an increased rent, and to many this is economically impossible or undesirable. Increased rates thus reduce the residential attractions of a district, check the movement into and stimulate the flow out of it, increasing the numbers of empty houses of this description, and tend to decrease the rents. But many of these houses can be, and frequently are, adapted for two or more families of the working class, and so enter into competition with and tend to decrease the rents of cottage property.

In conclusion, it is again necessary to em-

phasize the limited data with which this study has had to be made, and to urge the importance of research in districts more self-contained and remote from the influences which proximity to the metropolis on the one hand and growing suburban areas upon the other undoubtedly exert. Bearing in mind its limitations, this investigation does show that so far as West Ham is concerned, high rents are dependent neither upon sanitary administration nor high rates. These conditions may be used only as an excuse to hide the real cause, which appears to be a low percentage of empty houses.

A HEAVY PENALTY FOR ADULTERATED MILK.—The North-Eastern Dairy Company, Ltd., of Durham Road, Holloway, appeared before Mr. D'Eyncourt at North London on June 11th, to answer further a summons issued by the Islington Borough Council charging them with selling on April 2nd milk which contained 6 per cent. of water in addition to that normally present in milk. Alfred Henry Cobb said that he had been in the employment of the Company and their predecessors for twenty-five years. He remembered that on April 2nd a carrier named Webster fetched the churns from Finsbury Park Station and delivered them at the dairy. Some were from Mrs. Duvall, a farmer. They were guaranteed to contain pure milk. Webster also brought a churn of separated milk from the Eglington Dairy Company. Acting on written instructions from Mr. Palmer, the manager of the branch, the witness put from four to six quarts of the separated milk into each of the other churns containing pure milk. Certificates were produced of four previous convictions. It was also stated that the Company had been fined £50 at Thames Police Court in March last. Mr. D'Eyncourt said that the amount of adulteration was very small, but the case was about as bad as a case could possibly be. The worst feature was the way in which the case had been presented to the Court. In the first place a warranty had been pleaded and the servants of the Company had been put forward to swear that the milk had not been tampered with in any way. Everything seemed quite in order, and the summons might have been dismissed, the blame falling on the farmer; but an adjournment was obtained, and then the Company's servants admitted that they had committed perjury and that they had been in the habit of mixing separated milk with the farmers' pure milk. The whole system was fraudulent and disgraceful, and he should go to the limit of his powers and fine the Company £100 with 20 guineas costs. It would be for the Borough Council to consider what further steps should be taken with regard to the witnesses who had given evidence.

THE LOCAL INCIDENCE OF TUBERCULOSIS.

THE following tables were compiled by Dr. Harold Scurfield, Medical Officer of Health, Sheffield, from information supplied to him by the Medical Officers of Health of the respective towns. When the tables were complete they were sent out to the Medical Officers of Health by Dr. Scurfield together with a circular entitled "Crude Comments." The Medical Officers of Health were asked to comment on the tables with a view to the publication of the tables and the comments in PUBLIC HEALTH. We give below the tables, Dr. Scurfield's circular of "Crude Comments," and the comments of the Medical Officers of Health of the districts included in the tables.

TABLE I.

Tuberculosis of the lung (including phthisis) and other forms of tuberculosis in England and Wales and the large towns with over 100,000 population*, also in four largest Scotch towns.

Average mortality-rates per annum per million persons living during ten years 1898 to 1907 (except where otherwise stated).

Towns.	Estimated Population (1907).	Tuberculosis of Lung.		Other forms of Tuberculosis.			Remarks.
		Males (All ages).	Females (All ages).	Males (All ages).	Females (All ages).	Children (under five).	
England and Wales	34,945,600	1445	1033	582	487	2839	
Birkenhead	118,441	1611	1240	336	234	1820	
Birmingham	553,155	1818	886	494	394	2354	4 years, 1904-7
Blackburn..	134,438	1330	883	737	572	3956	
Bolton	182,917	1748	1094	471	344	2549	
Bradford ..	290,323	1616	920	561	420	2550	8 years, 1900-7
Brighton ..	129,023	1889	1021	657	437	3062	
Bristol	367,979	1233	981	—	—	1681	3 years, 1905-7
Burnley ..	103,947	1568	1145	446	336	2627	
Cardiff	187,620	1341	1162	660	585	2976	
Croydon ..	154,342	1293	781	528	432	2605	8 years, 1900-7
East Ham..	136,421	827	718	419	437	2070	7 years, 1901-7
Gateshead..	125,783	1623	1199	588	488	2567	6 years, 1902-7
Hull	266,762	1287	997	560	446	1990	
Leeds	470,268	1675	1028	801	671	4337	
Leicester ..	236,124	1523	990	571	402	3015	
Leyton	120,000	1161	745	478	367	2191	5 years, '02-4,6,7
Liverpool ..	746,144	2055	1361	662	524	3239	
London	4,758,218	2075	1168	668	515	3681	

* Eight of these towns were unable to supply the statistics asked for.

TABLE I.—continued.

Towns.	Estimated Population (1907).	Tuberculosis of Lung.		Other forms of Tuberculosis.			Remarks.
		Males (All ages).	Females (All ages).	Males (All ages).	Females (All ages).	Children (under five).	
Manchester	643,158	2433	1425	800	555	4265	
Norwich ..	119,191	1474	994	863	640	4661	
Nottingham	257,492	1581	1025	581	398	2907	
Oldham ..	141,730	1987	1202	605	465	2813	
Plymouth..	120,063	1443	1201	681	522	2980	
Portsmouth	208,291	1696	1289	373	249	2235	5 years, 1903-7
Salford	236,670	2189	1333	860	648	4526	
Sheffield ..	455,553	1523	990	571	402	3015	
S'uth'mpt'n	119,745	1644	1004	522	455	3028	
South Shields	113,460	1756	1365	792	697	3246	
Stockport..	100,986	1665	1170	699	652	3961	8 years, 1900-7
Sunderland	155,859	1664	1337	834	711	3887	
West Ham.	302,484	1523	1007	664	571	3160	
Willesden ..	144,376	1087	856	422	326	2063	
Wolverhampton, E.	40,597	1371	790	700	559	—	5 years, 1902-6
Wolverhampton, W.	60,903 (1906)	1008	544	430	354	—	5 years, 1902-6
Aberdeen ..	174,579	1452	1405	782	617	3328	
Dundee....	165,748	1785	1834	1099	764	4647	
Edinburgh..	345,967	1753	1239	824	637	4360	
Glasgow ...	847,584	1856	1665	944	793	4377	

"CRUDE COMMENTS" BY DR. SCURFIELD ON THE ANALYSIS OF THE TUBERCULOSIS DEATH-RATES IN THE LARGEST TOWNS OF GREAT BRITAIN.

Roughly speaking, in the English population—

1. The male death-rate from tuberculosis of the lungs is nearly half as much again as the female.
2. The female death-rate from tuberculosis of the lungs is about equal to the male and female death-rate from other forms of tuberculosis combined.
3. The male death-rate from other forms of tuberculosis is higher than the female (as six to five.)
4. The death-rate among children under five from "other forms" (tuberculosis of the lungs being almost a negligible quantity at these ages) is nearly twice the female death-rate from all forms of tuberculosis.

In the London population the death-rates are

all higher than in the English, but the above-mentioned proportions remain much the same except that the male death-rate is more than three-quarters as much again as the female.

Any great departure from the English standards or any great disturbance of the relations of the various rates to one another appear to be the points requiring explanation by the local medical officers of health, according as they may be considered to be due to occupations, housing conditions, age distribution of the population, climate, etc.

TABLE 2.

Tuberculosis of the lung (including phthisis) and other forms of tuberculosis in the Administrative County of London and certain of the Metropolitan Boroughs.*

Average mortality-rates per annum per million persons living during ten years 1898 to 1907 (except where otherwise stated).

Boroughs.	Estimated Population	Tuberculosis of Lung.		Other forms of Tuberculosis.			Remarks.
		Males (All ages).	Females (All ages).	Males (All ages).	Females (All ages).	Children (under five).	
Administr'tive Cnty. of L'nd'n	4,758,218	2075	1168	668	515	3681	
Battersea ..	181,736	1638	1108	605	440	2657	
Bermondsey..	127,856	2417	1364	789	728	4561	4 yrs., 1904-7
Chelsea ..	74,857	2231	1062	467	412	3082	7 yrs., 1901-7
Hampstead ..	91,137	1081	572	401	248	2278	
Islington ..	347,017	1901	1134	494	378	3010	
Kensington ..	180,500	1703	883	689	413	4081	
Lewisham ..	152,532	1118	685	459	331	2181	6 yrs., 1902-7
Paddington ..	149,542	1485	791	530	377	3084	
Shoreditch ..	114,700	2588	1512	1005	799	5191	
Southwark ..	209,781	2891	1723	756	683	4092	7 yrs., 1901-7
St'ke N'w'gt'n	51,247	1666	938	612	318	3117	7 yrs., 1901-7
Wandsworth..	325,850	1197	820	477	324	2503	
Woolwich ..	129,336	1632	1134	458	406	2058	5 yrs., 1903-7

* Thirteen only of the Metropolitan Boroughs were able to supply the statistics asked for.

In the seaports, except Liverpool and Southampton, the male death-rate is usually about 25 per cent. more than the female. Birkenhead has an extraordinarily low death-rate from other forms of tuberculosis among children under five in proportion to the female rate for all forms, the figures being respectively 1,820 and 1,474.

Birmingham and Sheffield are unique in having a male death-rate which is more than double the female (no doubt owing to the grinding trades); but while in Birmingham the rate for other forms among children under five is little more than

double the female death-rate from all forms of tuberculosis, in Sheffield the rate under five is almost treble the female rate. (What is the explanation of the difference between Birmingham and Sheffield?)

East Ham and Aberdeen have rates for men and women nearly equal, but in East Ham all the rates are remarkably low, while in the case of Aberdeen the male death-rate is about equal to the English rate, the female rate being high.

Dundee is unique in giving a higher phthisis rate for women than men, and also has the highest rate among children under five, except Norwich. (Is this due to the large number of women employed in the jute trade?)

In several cases the usual proportion between the rate under five years and the female rate for all forms (*i.e.*, two to one) is remarkably upset; *e.g.* :—

Blackburn	...	...	nearly 3 to 1
Norwich	...	...	" 3 to 1
Sheffield	...	...	" 3 to 1
Hampstead	...	...	" 3 to 1
Kensington	...	...	over 3 to 1

(Does this indicate home conditions which are bad for children and not for women, such as a bad milk supply?)

On the other hand, the proportion is upset in the opposite direction in the case of

Birkenhead	...	18 to 14½
Gateshead	...	25 to 17
Hull	...	20 to 14
Portsmouth	...	22 to 15

Edinburgh and Glasgow show high rates both for women and children.

(How far is the "flat" system responsible for this?)

COMMENTS OF THE MEDICAL OFFICERS OF HEALTH OF THE DISTRICTS INCLUDED IN THE TABLES.

COUNTY OF LONDON.

I am much obliged for the valuable figures you have sent me with your letter. As you have invited my comments on the London figures I should like to point out that there is a disturbing element of some magnitude in the London statistics which needs to be borne in mind in drawing conclusions from the figures, and particularly in comparing the sex death-rates. The female population of many of the better circumstanced London boroughs is greatly in excess of the normal at the phthisis ages owing to the large number of females employed as domestic servants. These females are for the most part drawn from the poorer circumstanced districts in London, or from districts outside the county, whither they return when attacked by chronic illness. The deaths of these females are necessarily recorded in the district in which they occur, and this has

an adverse effect on the female death-rates of the poorer circumstanced districts, while the death-rates of the better circumstanced districts, such as Hampstead, Kensington, etc., are correspondingly lowered.

Shirley F. Murphy, Medical Officer of Health.

METROPOLITAN BOROUGHES.

BATTERSEA.

1. The male death-rate is lower than the average for the county.

2. It compares favourably with other boroughs in which an industrial population preponderates. The nature of the occupation of the majority of the workers, viz., building trades, railway employees, and kindred outdoor employment, probably accounts for this, and the fact that there are comparatively few factories or dangerous trades, the absence of block-dwellings and tenement houses, and the favourable situation of the borough as regards open spaces; and, lastly, the high standard of sanitary administration enacted by the council.

The female death-rate again is lower than that for the county. It is somewhat lower than the average for an industrial metropolitan borough.

This is probably due to the fact that there is not a large amount of female labour, and that which obtains, largely laundry work, is not of a character to predispose to the disease.

It will be borne in mind that in the absence of statistics for the remainder of the metropolitan boroughs these deductions are to be accepted with a certain amount of reservation as regards the incidence of the disease of London.

The most striking feature in the Battersea statistics is the great decrease in the figures in regard to children under five years of age. Taking the average for the decennium (2,857) and comparing this with averages for first and second quinquennials respectively, it will be seen that the average for the first is greater than the decennial average, while that for the second is less. The difference between the averages for the first and second quinquennial is still more marked.

To what are these differences due?

1. In the first place they are partly to be explained by the general decline that has taken place in the mortality from all forms of tuberculosis.

2. The fall in the birth-rate is to some extent probably accountable for a decline in mortality.

3. The great attention paid in recent years in this borough to the question of infant mortality and the safeguarding of the milk-supply.

G. Quin Lennane, Medical Officer of Health.

BERMONDSEY.

I have examined the tuberculosis figures of Bermondsey in the light of the other figures

appertaining to England and Wales and the principal great towns in them and in Scotland, but cannot find anything unusual about the relative proportions of the different forms of the disease or the number of each sex attacked.

What strikes one is the relatively high incidence all round, which I think can be fully explained by the nature of the population and the housing conditions in this borough. Bermondsey is essentially a working-class borough. There is no exclusively residential portion, and the only people living in it not belonging to the labouring classes are small tradesmen, doctors, clergymen, and such people as are from business or philanthropic reasons compelled to live in it.

Owing to the long river frontage (viz., $3\frac{1}{2}$ miles) we have a very large number of wharves; the Surrey Commercial Docks, which comprise some 400 acres are also in this area, so that if one can speak of a staple industry here it might be said to consist of landing sea-borne goods, since there is no other single industry in the borough which employs anything near so many hands.

For this reason, therefore, there is an unusual amount of casual labour, with all its attendant evils.

In making inquiries into overcrowding, which is very prevalent, and into cases of phthisis, both of which I do personally, I have been greatly impressed with the frequency with which I receive replies in explanation of the cause, such as the following:—"Oh! my husband is a dock labourer, and only does an odd day's work, and I am obliged to 'do a bit' myself, and we therefore cannot afford a better lodging"; or "We were very short of food the time I (or my husband) took ill," if the reply is to the cause of phthisis.

I am of opinion, therefore, that a great deal of the tuberculosis in this borough is due to casual labour, poverty, with all its overcrowding, bad food, bad housing, and alcoholism. The whole series form a "vicious circle" when once started, but it seems to me that casual labour is the prime factor.

R. K. Brown, Medical Officer of Health.

CHELSEA.

The figures given relate to the years 1901-1907 inclusive, as in 1900 the vestries and district boards were converted into boroughs, and the boundaries and populations were considerably altered. For comparative purposes, therefore, the years 1898-1900 should not be considered.

The low female death-rate from phthisis and the high male death-rate in Chelsea is to be observed in a lesser degree in the rates for London as a whole. The comparison with England and Wales for the six years 1901-1906 shows that while the female death-rate in Chelsea is about equal to that of the country generally, the male

death-rate in Chelsea is 57 per cent. in excess of that of the country generally. In Chelsea about 20 per cent. of the female population aged ten years and upwards is engaged in domestic service. It seems probable that female domestic servants, if they contract tuberculosis, leave their situations, and their deaths are recorded elsewhere than in the borough of Chelsea. To a certain extent this might account for the female death-rate from phthisis in Chelsea being less than half that of the male rate. To some extent the female population in Chelsea is employed as charwomen and in laundries and workshops, but there is little or no industrial work carried on by women in Chelsea which is of a dangerously unhealthy character. Most of the married women are employed in household duties.

There is one common lodging house for women in Chelsea (52 beds), and four common lodging houses for men (337 beds). About ten deaths from phthisis occur annually amongst these common lodging house inmates, nearly all being males. This will not, however, account to any large extent for the high male death-rate in Chelsea.

The death-rate at all ages from other tubercular diseases appears to be lower in Chelsea than in London or in England and Wales, but the certification of these diseases is a matter of some uncertainty, and the numbers are rather small for comparative purposes. So far as it goes, however, the low death-rate from other tubercular diseases suggests that there is some unusual cause for the high male death-rate from phthisis.

As regards the industrial conditions for males in Chelsea, they are probably very much the same as in other western metropolitan boroughs, and are of the most varying character.

Louis C. Parkes, Medical Officer of Health.

HAMPSTEAD.

The low rates in Hampstead must be attributed partly to the situation of the district, which stands high and is well provided with open spaces, and partly to the favourable economic position of a considerable proportion of the population. During the last five years efforts have been made for the prevention of tuberculosis both by the Borough Council and by an organised voluntary movement. An adequate discussion of all the factors involved cannot, from want of space, be attempted.

G. F. McCleary, Medical Officer of Health.

KENSINGTON.

Kensington, in common with Sheffield, has a rate under five years which is nearly three times the female rate for all forms. A large percentage of the mothers in my district go out to work early in the morning and do not return to their homes until late at night. Their children in the meantime are left in crèches or minded by a neighbour. It

seems possible that a woman who walks daily to and from her work and who is employed in a workshop under the supervision of the sanitary authority might be less susceptible to phthisis than a woman who spends her life indoors looking after a large family of children. On the other hand, the children of mothers who go out to work are likely to be badly fed and underfed and so might acquire, through a general lowering of resistance to disease, a special liability to tuberculosis.

If the employment of women operates in the manner suggested, it affords both an explanation of the enhanced rate among children and the lowered rate amongst women in this borough.

J. E. Sandilands, Medical Officer of Health.

SHOREDITCH.

The figures relating to Shoreditch are high. Predominating factors as regards the high tuberculosis mortality in this borough are doubtless the great density of the population—180 persons to the acre—and the large proportion of the population belonging to the poorer working class."

Lewis H. Fraser Bryett, Medical Officer of Health.

SOUTHWARK.

Although the mortality rate for phthisis in Southwark is the highest in the metropolis, yet during the last seven years the rate has very considerably declined both in males and females. Our high rate in both sexes is largely due to the great number of common lodging-houses found in the borough. We know that the residents of these places are persons who are badly fed, often diseased, and fall an easy prey to phthisis.

There are other conditions in Southwark, such as overcrowding, and the poor and dirty condition of the inhabitants. Some portions of our borough are inhabited by costermongers, hawkers, and such traders. Phthisis amongst this class of persons is prevalent on account of the irregular life they lead. There has been a considerable decline also during the last seven years in the mortality rate from other forms of tuberculosis, especially in children. This I consider has been due to the effort that has been made on the part of the public health staff to get mothers to breast-feed their children.

The northern half of our borough is occupied by the casual labourer class, many of whom work in the docks and on the river side. Their occupation is extremely fitful, and their habits anything but steady. Tuberculosis is very prevalent amongst children of this class.

G. B. Millson, Medical Officer of Health.

STOKE NEWINGTON.

The deaths sent to you from Stoke Newington did not include those which occurred among non-parishioners in public institutions. I must confess

that I am at a loss to explain the circumstance that the male mortality from tuberculosis of lungs and also from other forms of tuberculosis should be as high as it is, seeing that the female mortality is in both cases so low. It may safely be said that there is very little employment of women outside their homes in Stoke Newington, and this circumstance may explain much of the low female rates. With reference to the high rates amongst males, it does not seem that the matter of age and sex distribution is likely to have played an important part, nor can the occupational circumstances in Stoke Newington have done so. The housing circumstances of the population are fairly good (for the most part exceptionally good), and we have extremely few industries such as those which have been found to be specially liable to induce consumption among the workers. I note that even our death-rate amongst males is below the *mean of London* as a whole; and I would remind you that our population being small, the numbers on which you base your rates are necessarily small also. It is possible that if these observations are extended over some years, the figures of male mortality from tuberculosis in Stoke Newington may average a much lower figure.

Henry Kenwood, Medical Officer of Health.

WANDSWORTH.

Although the population of Wandsworth has increased by 58 per cent. since 1898, yet the death-rate from tuberculosis has decreased compared with the decennial average, and this is the case with regard to both sexes.

As the borough is largely residential the rate is low compared with the majority of the metropolitan boroughs, and it is also lower than the decennial average for England and Wales.

The rate for other forms of tuberculosis at all ages and of children under five years is also lower than the rates for London and England and Wales.

The housing conditions in the borough are generally satisfactory, as a considerable proportion of the houses have been erected during the last twenty years.

P. Caldwell Smith, Medical Officer of Health.

WOOLWICH.

The chief particulars in which the tuberculosis figures differ from those of London is the proportion of phthisical males and phthisical females. This is partially due to the error of small numbers, and the figures for 1908, if included, would considerably alter the proportion.

In 1908 the number of deaths from phthisis in males was nearly double that in females. There does, however, appear to be a more rapid reduction in Woolwich in the male death-rate from

phthisis than in the female, and I attribute this partially to diminished alcoholism and frequenting of public-houses, and partially to sanatorial treatment, of which men avail themselves more than women.

Sidney Davies, Medical Officer of Health.

OTHER DISTRICTS.

ABERDEEN.

I am not aware that the figures for Aberdeen demand any special comment. I observe you remark on the fact of the phthisis rate for men and women being nearly equal in Aberdeen. I may say that this has been their position since registration began in 1855, with a tendency towards a slightly higher rate among women than among men—the difference amounting to 1 to 5 per cent. for the various quinquennial periods. On the whole, the rate for females has fallen a little more than among males.

The death-rate from phthisis in Aberdeen is, as you will observe, one of the lowest among the larger towns in Great Britain, and its lowness is still more evident if the average for the last two or three years is taken in place of the average of the last ten. Owing to the rapid fall in recent years of the phthisis death-rate, it is scarcely fair to compare an average of the last five years in one town with an average of the last ten in another town, as in your table. It would have been better, I think, to have taken the last five years in every case, which would have put all the places compared on a footing of equality, excepting Birmingham and Bristol.

It is difficult to state with confidence what are the causes of the low phthisis rate in Aberdeen. It cannot be due to climate, for the neighbouring town of Dundee, with almost the same climate, suffers from an exceptionally high rate. We differ, however, from Dundee in having a smaller proportion of our women employed in factory work. The general sanitation of the town has been very actively attended to for the last twenty years, so that the house drainage has everywhere been modernised, and is as nearly perfect as one could expect to have it. The housing of the working classes in Aberdeen is probably better than the average of other towns, and a considerable amount of slum property has been cleared away within the last twenty years.

Not much has been done in a direct crusade against the tubercular germ, but a considerable effort has been made to educate the people generally as to the infectiousness of tubercular disease, and in this the Public Health Department has enjoyed the co-operation of an intelligent medical profession, who rarely fail nowadays to inform their patients of the value of the open window, and of the need for some degree of isolation, and for care of the sputum. We have not

yet ventured upon either compulsory or voluntary notification, but there is no difficulty in getting into contact with a large proportion of the living cases through dead cases; for usually where death has entered a family, because of tuberculosis, other members of the family, or near relatives, are frequently found to be suffering from the disease in some form. For many years we have disinfected houses after death from phthisis, and have an arrangement with the registrars under which all such deaths are immediately notified to us. But this cannot have exercised much influence in preventing the spread of the disease. There is only a small sanatorium, for the treatment of poor cases, in the vicinity of Aberdeen. It is entirely supported voluntarily. We are at present engaged in enlarging and re-modelling one of the pavilions of the fever hospital of the city, with a view to providing accommodation for more or less advanced cases of phthisis.

All the dairies within the area of the city are subject to regular veterinary inspection, but we have no means of enforcing similar control of outside dairies. So far as bacteriological examination has been made of the milk, about four per cent. of the milks have revealed the presence of tubercle. In my own experience a large proportion of tubercular cases in children can be sufficiently explained by the presence of phthisis—often chronic and mild—in the parents, especially the mother.

I have done a considerable amount of work myself in visiting cases throughout the city and making myself fully acquainted with the conditions tending to spread tuberculosis, and I hope to publish soon the results of this inquiry.

It is, of course, of importance in seeking to compare the rates of one town with those of another to bear in mind that certain of the public institutions of a town may be situated outside the town, and that the deaths occurring in such an institution may be registered within the district in which the institution is situated, and not in the town. For example, in the case of some towns in Scotland the poor-house or pauper lunatic asylum is outside the boundary of the town. In such institutions, especially in poor-houses, there is usually a considerable number of deaths from phthisis, and their omission from the death register of the town may considerably affect the tubercular death-rate. The figures sent you for Aberdeen do not require correction for such deaths.

Matthew Hay, Medical Officer of Health.

BIRKENHEAD.

I have very carefully considered the tuberculosis mortality rates you kindly sent me, especially with regard to the figures for Birkenhead, but the more I think them over the more

unable I am to explain the peculiar characteristics of the return for this town. It is true that we pay very special attention to meat, milk and food inspection here, which appears to bear on the low rate for children under five years, but I have no reason to suppose that other towns are not paying as great attention to these matters as we are.

It is obvious to me that these tuberculosis rates are the result of many factors (not one or two) of some of which at present we have no knowledge and which require to be further sought for. Your figures are very important and interesting, and will make many of us try and find the key to the problem.

Why should Liverpool and Birkenhead be so different? We have very similar populations engaged in similar work and living under similar conditions—practically we are parts of one great population.

Then it is clear that wet years or dry years apparently do not affect the rate; hot years and cold the same.

Towns which have compulsory notification of the disease, milk depots, etc., apparently are no better off than those that have not.

Rich and well-to-do districts like Kensington are no better off than East Ham and Leyton, although their geographical positions are not wide apart.

It is therefore clear to my mind that as yet we have only got information of one portion of the factors involved in this complex question, and others will have to be found before an explanation can be given.

R. Sydney Marsden, Medical Officer of Health.

BLACKBURN.

In seeking for an explanation for the variation in the proportion between the death-rate amongst children under five years of age from other forms of tuberculosis and the female death-rate for all forms, I have come to the conclusion that the home conditions prevalent in this town are mainly responsible. In Blackburn there were 3,148 married female workers in the mills at the 1901 census. This necessarily involves the nursing of large numbers of children away from their homes during the day time, and also, in some cases, errors in the diet of such children. It is well known that large numbers of the young children are carried by their mothers, before six o'clock in the morning, to houses where they are nursed during the day time. For this purpose the children are frequently taken from a warm bed and are not clothed sufficiently to balance this great change of temperature. The children are then carried back in the evening. The homes of many of these children and the houses where they are nursed are often a considerable distance apart.

It is possible, of course, that the milk supply

may be partly responsible. About three-fourths of the milk consumed in Blackburn comes from districts outside the borough.

The inspection of cows, etc., in outside farms is less efficient than it is amongst the ninety farms within the borough.

The female death-rate from tuberculosis of the lungs is about half as much again as the male and female death-rates from other forms of tuberculosis combined, as compared with the English population, where the female death-rate from tuberculosis of the lungs is about equal to the male and female death-rate from other forms of tuberculosis combined.

It is possible that the occupations of such a large number of women in the cotton mills of the town may to some extent, either directly or indirectly, account for this difference.

Alfred Greenwood, Medical Officer of Health.

BOLTON.

The Bolton death-rates from all forms of tuberculosis are not above the average for England and Wales, except in the case of tuberculosis of lungs in males.

The proportions between the female and male death-rates also correspond fairly to those for England and Wales—that is to say, the male death-rate from tuberculosis of the lung is rather more than half as much again as the female death-rate. The female death-rate from tuberculosis of the lungs is 25 per cent. more than the male and female death-rate from other forms of tuberculosis combined. The male death-rate from other forms is higher than the female.

The death-rate among children under five from "other forms" is nearly twice the female death-rate from all forms.

The English standards, therefore, are only departed from in Bolton in the case of tuberculosis of the lung in males.

This can be accounted for by the chief occupations of the males, viz., cotton spinning and machinery, in both of which occupations there is still a high death-rate (2.0 and 2.7 per 1,000) for tuberculosis of the lung.

The females are chiefly engaged in the card room and in weaving sheds. In these latter occupations there has been a great improvement in the conditions during the last ten years, and it is surprising not to find the death-rate higher than it is.

The housing conditions have very much improved in Bolton during the last fifteen years, and there are only now about 1,600 back-to-back or single houses.

The climate, however, is not a good one, the rainfall being 42 in. per annum on a clay soil with frequent and great changes of temperature.

The death-rate from tuberculosis of the lung has steadily decreased both in males and females since 1899, and I attribute this almost entirely to the greatly improved conditions both in occupations and in housing.

J. E. Gould, Medical Officer of Health.

BRADFORD.

In regard to Bradford, only one figure requires explanation, and that is the relatively high death-rate from tuberculosis of the lungs in males, viz., 1,616 per million, in comparison with 1,445 per million for England and Wales. A reference to the mortality statistics shows that phthisis is a particularly common cause of death amongst men engaged in the wool-combing industry. The combing of wool by machinery is carried on continuously by day and night in an atmosphere which is raised to a high temperature, and a large number of men are engaged in it. The work is practically unskilled labour and attracts the poorest section of the population.

Almost all the wool-combers have an unhealthy appearance.

In my opinion the nature of the employment renders the wool-combers particularly prone to infection by tuberculosis.

W. A. Evans, Medical Officer of Health.

BRIGHTON.

1. The comparatively low death-rate in females as compared with males is probably due to the extremely satisfactory housing conditions present in Brighton.

2. 17.4 per cent. of all deaths for the ten years 1898 to 1907 is due to imported cases, this apart from persons dying in public institutions; this percentage is probably greater than that occurring in other towns.

3. Dr. Newsholme found that "owing to the fact" that a larger proportion of the Brighton population than that of England and Wales is more susceptible to phthisis, a correction factor of '9267 should be applied to the phthisis death-rate.

D. Forbes, Medical Officer of Health.

BRISTOL.

I have carefully looked through your interesting statistics about tuberculosis and your comments on the same. So far as I can see, Bristol differs so inconsiderably from the average conditions that it calls for no special comments beyond those which you have given.

W. E. Davies, Medical Officer of Health.

CARDIFF.

I believe the relatively low death-rate amongst males from phthisis in Cardiff to be due to the influence of occupation. There are no large factories in Cardiff confining the male workers

indoors. Further, there are no large and overcrowded tenement dwellings, and very few one-room tenements in Cardiff. Most of the labouring population are engaged in out-of-door work at the docks and other places and their housing accommodation is fairly satisfactory.

E. Walford, Medical Officer of Health.

DUNDEE.

I have considered your interesting statistics regarding tuberculosis in its various forms, and note specially the abnormal relation of the male death-rate to that of females in Dundee.

I cannot account for this unless your explanation as to the employment of women in our textile industries is the correct one.

Something like 50 per cent. of all females over ten are at work, and 37 per cent. are employed in the textile trades; that is to say, 74 per cent. of all "occupied" women work in our mills and factories.

In the jute trade about 51 per cent. of the employees are women over twenty years of age—22 per cent. are girls under twenty—11 per cent. are boys under twenty, and only 16 per cent. are men.

With regard to our abnormally high death-rate of children under five I cannot give any explanation. Our milk supply is average in quality, and there is nothing that occurs to me to explain the position.

C. Templeman, Medical Officer of Health.

EAST HAM.

The most striking features in connection with the statistics dealing with the mortality from tuberculosis in this district are:—

- 1st. That all the rates are very low.
- 2nd. That in comparison with other towns the mortality from tuberculosis of the lungs in males is remarkably low.
- 3rd. The rates for the two sexes are practically equal.

It is impossible to be dogmatic as to the cause or causes concerned in producing the above conditions. I am of opinion, however, that the following are probably the most important factors:

SITUATION.—This is very favourable. On three sides of the borough there is a belt of open country. On the north are Wanstead Park and Flats (1,700 acres), on the south is the river Thames, and on the east the river Roding, with much undeveloped land in the valley of this stream. It is only in the west that it is closed in by the adjoining borough of West Ham. The presence of this open country on three sides, together with the many parks and open spaces in the borough, no doubt exercises a favourable influence in connection with this disease.

HOUSING.—The district is practically all of recent development; the housing is therefore above the average, being all of modern construction. There are no back-to-back houses, and there is an entire absence of the narrow courts, alleys and slums, which are more or less present in all older towns. This is, without doubt, a very important factor.

SOIL.—With the exception of a portion of the south of the borough, the entire district is situated on excellent gravel soil, which is everywhere found within a few inches of the surface. It is significant to note that in the south portion of the borough, which is not on gravel soil, the death-rate from tuberculosis and diseases of the respiratory system is nearly double the rate for the rest of the borough. It is, however, probable that other factors are also present which are partly responsible for the increased rate in this particular area.

EMPLOYMENT.—There are practically no factories here, and though from a pecuniary point their absence may be deplored, it follows that there are no unhealthy trades and also no smoke or other fumes to pollute the air.

The borough is practically a dormitory for London, a large proportion of the population of both sexes being employed there in warehouses, offices, shops, etc. This probably explains why the death-rates for the two sexes are about equal; both are largely engaged in sedentary indoor occupations, doubtless under very similar conditions, and therefore tending to produce approximately equivalent results.

J. Sowden, Medical Officer of Health.

EDINBURGH.

1. The male death-rate from tuberculosis of the lungs is in excess of the female in almost the same proportion as shown for England and Wales.

2. The female rate from tuberculosis of the lungs certainly falls short of the combined rate from other forms, but not to a very marked extent.

3. I find this is approximately the ratio in the Edinburgh figures.

4. The usual proportion as between the "death-rate under five years" and the "females from all causes" is certainly exceeded in the case of Edinburgh—being 1 to 2 (about) 2½ instead of 1 to 2, but the figures show that the mortality under five years is diminishing. This circumstance is, of course, in keeping with the milk theory, seeing a great deal has been done in recent years to improve the milk supply.

A. Maxwell Williamson, Medical Officer of Health.

The above numbers refer to the numbers in the "Crude Comments."

HULL.

The City of Hull is surrounded on the north, east and west by large agricultural districts, and on the south by the river Humber.

The streets for the most part are wide, and are well paved and drained. There is a good water supply, and being surrounded by rural districts the milk supply is also good.

The city comprises one of the largest artisan populations in the country, with cheap house accommodation.

Much has been done in recent years in applying the provisions of the Housing of the Working Classes Act for the closure of insanitary dwellings.

There are practically no manufactories where married women are employed. The leading industries are shipbuilding, seed crushing, flour mills, paint and colour works, starch, blue and blacklead works, shipping, and the fishing industry.

The yearly average deaths from consumption of the lungs (including phthisis) in Hull for the years 1898-1907 was 281, the average death-rate being 1.1 per 1,000. The death-rate for the year 1907 was 1.1 per 1,000.

The yearly average of deaths amongst males for 1898-1907 numbered 155, being 29 in excess of females.

The yearly average deaths from other forms of tuberculosis for 1898-1907 was 123, the average death-rate being 0.49 per 1,000, as compared with a death-rate of 0.45 for 1907.

The yearly average deaths of children from other tubercular diseases for 1898-1907 was 61, as compared with 58 in 1907.

The total number of deaths from tuberculosis of the lungs in 1898-1907 was 2,818, as compared with 1,239 deaths from other forms of tuberculosis, the former being slightly more than two to one compared with the latter.

It will further be noted that of the total deaths (1,239) from other forms of tuberculosis about one-half (614) are children under five years of age.

Occupation does not appear to influence the death-rate from consumption in Hull, but probably the clayey subsoil of the city, its extreme flatness, and the frequent fogs in the winter months contribute to the mortality.

In a recent Parliamentary Bill promoted by the Hull Corporation power was sought to make consumption of the lungs a notifiable disease, but on a poll of the citizens being taken the whole Bill was defeated.

Voluntary notification of the disease was adopted in 1905, but no provision has up to the present been made by the Corporation for the isolation of cases of the disease. Owing, however, to the benevolence of Sir James Reckitt, Bart., accommodation for the treatment of a limited number of cases of consumption has been

provided at the Convalescent Home, Withernsea, about eighteen miles from Hull.

J. W. Mason, Medical Officer of Health.

LEICESTER.

In Leicester the two principal industries are the manufacture of boots and shoes and of hosiery. Both trades, and especially the latter, employ large numbers of women and girls, and there is therefore in Leicester a great demand for female labour. Besides those working in factories, many women do "home work."

The conditions of labour in the hosiery trade are not, speaking generally, unfavourable to health. As regards the boot and shoe trade, this has usually been considered a specially bad trade as regards tuberculosis, and in the old days, when much of the work was done by hand in small, badly ventilated workshops, this view was no doubt correct. The process of "finishing" was probably the most injurious. The pressure of the last against the chest used frequently to lead to permanent deformity. During the past twenty years, however, the methods of manufacture have greatly changed, and almost all the work is now done by machinery in modern factories fitted with special dust-removing apparatus to all finishing machines. The boot and shoe trade, therefore, is now much less injurious to health than was formerly the case, and I am not sure how far the fact that so many more men than women are employed in this trade accounts for the higher phthisis rate amongst males.

C. K. Millard, Medical Officer of Health.

LIVERPOOL.

LUNGS.—Statistics relating to tuberculosis of the lungs during the last ten years in the City of Liverpool continue to show the decline which marked the two preceding decades. The returns for the last thirty years or more show a very much more pronounced diminution in the case of females than in the males, a circumstance which may be easily explained by the drifting into the city of broken-down men, either seafarers or others, from other towns, who tend to drift into great seaports.

OTHER FORMS OF TUBERCULOSIS.—With regard to other forms of tuberculosis a similar diminution is apparent.

The decline amongst children under five years is happily also very marked.

It must be remembered that for a quarter of a century Liverpool has been a city of very great sanitary activity in every direction, but notably in reference to the improvement of the dwellings of the poorer classes, who form so large a proportion of the entire population.

The poor-law hospitals and the special hospitals for consumption have also done valuable work in

isolating patients during a part, at least, of their infective illness.

Another interesting point is that of late years the maximum mortality is taking place at a later age; in other words, death is postponed and useful life prolonged. For example, during the three years ending 1907 there is a decline at each age period up to fifty years of age.

With regard to children under five years, it is not unlikely that in addition to the benefits which they would derive from the improvements in general sanitation, the special measures directed to ensure a pure milk supply have not been without their effect.

E. W. Hope, Medical Officer of Health.

NORWICH.

The Norwich rate for children under five is probably slightly heightened by my practice of regarding deaths in children over four months of age which are assigned to "marasmus" (without explanation of cause) as being due to tuberculous disease.

The poorer classes in Norwich, which is a city where, on the whole, the average wage is low, cannot as a rule afford to give their children a liberal supply of milk. Many of the homes are badly ventilated, and much of the milk used is open to contamination after it has left the cow. The larger portion of the supply comes from the county; within the city itself great care has been taken of late years to prevent the sale of milk from tuberculous animals, and now that a medical officer of health has been appointed for the county, increasing vigilance will doubtless be maintained outside.

H. Cooper Patlin, Medical Officer of Health.

NOTTINGHAM.

The rate of mortality from tuberculous diseases is slowly declining in Nottingham, although in the opinion of Dr. John Tatham the death-rate from phthisis among lace and hosiery workers (lace and hosiery being the staple industries of the city) is practically stationary.

My recent investigation of the incidence of fatal tuberculous diseases upon males and females of various ages and circumstances in Nottingham for a period of two years showed that the death-rate of industrially occupied males was 2.41 per 1,000 males so engaged, and that of industrially occupied females only 0.86 per 1,000 (2.41 and 0.86 per 100,000) respectively. It must, however, be borne in mind that a large proportion of the females classed as industrially employed are out-workers who do the work in respect of which they are so classed for the most part in their own homes. No less than 2,426 and 3,194 of such workers were reported to the local authority under different schedules during 1907, and these numbers by no

means exhaust the total of women who would be classed in the census returns as industrially employed. Most of them are lace workers, only 329 of the first number given above and 751 of the second being makers up of hosiery and other wearing apparel. The majority of the men, on the other hand, classed as industrially employed are engaged in factories, workshops and other like places. The low death-rate from phthisis among industrially employed females in Nottingham, where so many are home-workers, would seem to suggest that the conditions as affecting health among the majority of these are not quite so unfavourable as has lately been alleged in the public press.

The deaths of males in Nottingham from phthisis alone during 1907 were 206 in number, and those of females 125. The corresponding death-rates were 1.72 per 1,000 for males, and 0.91 for females. The mean death-rates of males and females respectively from phthisis in Nottingham during the ten years ended with 1907 were 1.58 and 1.02 per 1,000.

Philip Boobbyer, Medical Officer of Health.

OLDHAM.

The figures in Oldham do not vary greatly from the average relationship in the several rates recorded in the table.

As regards the rates from tuberculosis of the lung at all ages Oldham has a high rate, especially in the rates for the male deaths. The following conditions probably have some influence upon this variation:—

1. The population being for the last few years considerably under-estimated.
2. The presence of a certain number of grinders in the town.
3. The smoky and damp atmosphere combined with the exposed situation of the town.
4. Pneumonia is fairly prevalent, and probably lays the foundation for a considerable number of cases.

The death-rates from other forms of tuberculosis are about the average for England and Wales.

James B. Wilkinson, Medical Officer of Health.

SHEFFIELD.

The remarkable features of the Sheffield statistics are:—

1. The low consumption rate for women.
2. The high consumption rate for men.
3. The high rate for children from "other forms."

It seems to me that the low rate for women indicates the natural advantages of Sheffield. The climate is considered bracing. The many hills on which the town is built allow the fresh air from the moors to circulate round the houses. The hills also enable the subsoil to be drained readily.

were of the better tenement class, consisting of houses occupied mostly by not more than two families, and where the rentals paid were between £30 and £50 a year.

Class 3.—Streets in which the prevailing type of house consisted of one, two, three or four-roomed tenements, and where the rental was less than £30 a year.

Class 1, which constitutes about 11 per cent. of the population of Willesden, in round figures averages about five persons per house; Class 2, constituting about 43 per cent., averages about six persons per house; while Class 3, constituting about 45 per cent., averages about eight persons per house.

Taking the phthisical death-rates of each of these classes the following results are obtained. The rates are the mean rates of the respective classes for the years 1905-6-7-8.

Class 1. ...	463 per 1,000,000
" 2. ...	920 " "
" 3. ...	1,117 " "

I have also got out the phthisical death-rate for different areas in my district grouped naturally according to the prevailing social type, and I find that the mean rates range from as low as 137 per 1,000,000 to 1,450 per 1,000,000.

These differences are accounted for, I believe, mainly by differences of social and domestic habits, and by differences of environment. In the main it is the well housed, well fed and properly clothed classes, observing hygienic régime in their modes of living, who are comparatively exempt from tuberculous disease. The poverty stricken, underfed and badly housed classes, whose habits bear no relation to those of a healthy life, are those who suffer in greatest degree from tuberculous disease.

During the ten years the changes in the character of the population have been such as are consistent rather with an increase than a decrease in tuberculous affections; that is to say the increase in population has been at a higher rate amongst the working-class element than among the residential class. Notwithstanding this adverse circumstance the low rates of mortality from tuberculosis have been fully maintained.

W. Butler, Medical Officer of Health.

WOLVERHAMPTON.

The East sub-district is relatively much the poorest, containing nearly all our slum property and few residential houses; the population is largely of the working classes, and of the poorest of these. The birth-rate is much higher than the West—ten years' average 34 to 28; young child population would be higher in proportion to the whole population than in the West.

The average (five years) death-rates per million of population are, at all ages:—

	Tuberculosis of Lung.		Other Tuberculosis.	
	Male.	Female.	Male.	Female.
East	1,371	790	700	559
West	1,008	544	430	354
Ratio of East to West	1'36	1'45	1'63	1'58
Both sexes	1'39		1'60	

The "other tuberculosis" is mostly among young children, and as these are relatively to the whole population more in the East, the rates of the whole population would be somewhat higher in the East; this would probably in part explain why these rates are relatively higher in the East than the lung rates. This is also partly due to the greater squalor amongst the children in the East. Otherwise the figures show such a difference as would naturally arise from the poorer feeding and worse ventilation in the East. A large proportion of the female population in the west are domestic servants, a class little exposed to phthisis; this may account for slight excess in the East female phthisis ratio over the total phthisis ratio. I am unable to explain the great excess of the male phthisis rates in the whole borough. It is evidently due to occupation, and yet I should have thought that many female occupations were more confined and "phthisical" than the male. We have some dry grinding (East), and much polishing work (both districts) which is dusty, but is done by women as well as men.

Henry Malet, Medical Officer of Health.

[Dr. A. Mearns Frazer regrets that owing to illness he is unable to give the comments for Portsmouth.]

LISTS OF OUTWORKERS.—There is very often considerable difficulty in dealing with these lists of outworkers. The incorrect and insufficient addresses occurring therein are numerous, and much time is taken up in tracing the outworkers in these cases or in corresponding with the employers in an endeavour to obtain the correct addresses. Employers are to blame for accepting addresses from their outworkers which are obviously insufficient, but this is only a minor cause of the difficulty. It is attributable in the main to the outworkers themselves giving incorrect addresses and failing to notify to the employers any change of address. Some legal obligation on the outworker to furnish the employer with his or her correct address and to notify to him any change thereof would have a salutary effect, and would seem to be a necessary complement to the obligation the employers themselves are under to keep a record of the names and addresses of their outworkers, and to supply copies thereof to the sanitary authority.—*Annual Report of Dr. Francis H. May, Medical Officer of Health, Aston Manor.*

COMPLIMENTARY DINNER TO DR. J. F. W. TATHAM.

A COMPLIMENTARY dinner was given to Dr. J. F. W. Tatham at the Grand Hotel, Charing Cross, on June 17th, 1909, on his retirement from the office of Superintendent of Statistics in the Registrar-General's Department. Sir Shirley Murphy was in the chair, and among those present were Sir William Dunbar (Registrar-General), Mr. Brudenell Carter, Dr. Whitelegge, Dr. Newman, Dr. McVail, Dr. Niven, Dr. S. Sprigge, Col. Lane Notter, Dr. Theodore Thomson, Col. Firth, Dr. Sykes, Mr. Lempfert, Mr. A. C. Waters, Mr. Udny Yule, Dr. Dickson, Dr. Coupland, Dr. Bruce Low, Dr. Barwise, Dr. J. Kerr, Dr. T. H. C. Stevenson, Dr. Robertson, Dr. Buchanan, Dr. Bate, Dr. Millson, Dr. Craven, Dr. Herbert Jones, Dr. Sweeting, Dr. G. Reid, Dr. Chalmers, Col. Macpherson, Dr. Bulstrode, Dr. Martin, Dr. Young, Dr. Darra Mair, Mr. Kenneth Goadby, Dr. W. H. Hamer, Dr. News-holme, Dr. J. F. Payne, Dr. H. F. Parsons, Mr. George King, Professor Simpson, Dr. Dawson Williams, Dr. Copeman, Dr. F. J. Allan, Dr. Fremantle, Dr. Anningson, Dr. Fletcher, Dr. Mussen, Mr. G. H. Day, and Dr. W. A. Bond.

Messages regretting their inability to attend were received from Sir R. D. Powell, Dr. Frederick Roberts, Sir Henry Littlejohn, Dr. E. Seaton, Sir Clifford Allbutt (who wrote of the esteem and admiration of Dr. Tatham's Cambridge colleagues), Prof. Woodhead (who wrote in the same sense), Dr. Armstrong (who regretted not being able to be with Dr. Tatham and his other old friends on the occasion—he had known Dr. Tatham nearly forty years), Dr. Tattersall (who described himself as one who had directly benefited by Dr. Tatham's work), Dr. D. S. Davies (who would have liked to join in showing his high appreciation of Dr. Tatham's services to public health), Dr. Sergeant (who would much have liked to do honour to an old friend), Dr. F. Roberts, Dr. Boobyer, Dr. Sydney Marsden, Dr. H. C. Pattin, Dr. M. K. Robinson, Dr. S. W. Wheaton, Dr. H. L. P. Hulbert, Dr. Priestley, Dr. Kenwood, Dr. Nash, Dr. Dryburgh Gold, Dr. Killick Millard, Col. Melville, Dr. Matthew Hay, Dr. G. F. McCleary, Dr. E. W. Hope, represented by Dr. Mussen, Mr. W. N. Shaw, F.R.S., represented by Mr. Lempfert.

The toasts were confined to those of "The King" and of "The Guest of the Evening."

THE CHAIRMAN, in proposing the health of Dr. Tatham, said:—The object of our gathering to-night is not to make speeches; it is really to give us an opportunity of showing Dr. Tatham how much we esteem him, and to give him an opportunity of meeting some old friends before he

retires from his office. I am not, therefore, in proposing his health—a duty which devolves upon me as his oldest friend, a friend of some thirty-five years' standing—going to make a long oration about his virtues. I purpose limiting my remarks to certain things that we ought properly to have in our minds on this occasion, and which I believe will have your sympathy. I am glad to say the Registrar-General, Sir William Dunbar, who has been good enough to join us to-night, has consented at my request to make a few remarks on the same subject, and then we shall hear Dr. Tatham. After that I hope we shall have an opportunity of talking to him. In thinking of what I shall say to-night I confess I feel in some difficulty, because there are so many subjects associated with our guest. There is Dr. Tatham, our old friend, the Superintendent of Statistics; there is his relation to public health; there is the obligation which public health owes to statistics; and many other considerations present themselves in such a way that it is difficult to get a clear line for the purposes of a few minutes' speech after dinner. I think I may perhaps with some appropriateness refer to Dr. Tatham's sixteen years' work at Somerset House, inasmuch as that is the crowning work of his life. (Applause.) Now if we went into Trafalgar Square one thing is perfectly clear, and that is that we might ask every person we met if they had ever heard of Dr. Tatham, and they would say they had never heard of him. Some of them might have heard of Somerset House, but none of them would know there is a Superintendent of Statistics there. Yet we who are engaged in work affecting the public health of this country deem the work of the Superintendent of Statistics of so much importance that we are gathered to do honour to Dr. Tatham and to the office which he has held. Perhaps we can do that best by a very brief reference to the nature of Dr. Tatham's duties. To put it shortly, I may say that Dr. Tatham's work has related especially to the classification of causes of death. That is, of course, only a bare outline. Dr. Tatham is not the first occupant of this office. He was preceded by that great man Dr. Farr, who was followed by his distinguished successor, Dr. Ogle. Dr. Tatham's tenure of office has been coincident with a development of the knowledge of medicine at a time most important in its history—a time when medicine was becoming a scientific profession, and therefore Dr. Tatham's work has had an importance which perhaps especially emphasises it. Dr. Farr deserves exceptional credit, because upon him devolved the first duty of designing the system of classification that has been established and followed at Somerset House. Dr. Farr realised from the very beginning what uses could be made of the registration of deaths. He himself said in one of his writings that the classification must

relate to the causes and prevention of death. And so we have had, for our own work of prevention of disease and the prevention of death, material provided by the work of Dr. Farr, Dr. Ogle and Dr. Tatham. Dr. Farr's system has been so good and so remarkably able that it has only required modification as medical knowledge has grown. Dr. Ogle modified it in some degree, bringing it into line with more recent thought concerning pathology and etiology—I may say especially concerning etiology, because the whole idea of Dr. Farr's classification was that it was etiological. Dr. Tatham, following Dr. Ogle, has had still greater necessity of modifying the classification of causes of death, and he has brought that classification into line with the most accurate medical thought that we have. In that way he has produced, or rather our friend the Registrar-General has produced, with Dr. Tatham's assistance, a mass of valuable material which I should think all of us round this table daily use. (Applause.) Now I think I shall not be exaggerating at all if I say that this work of Dr. Tatham, this work of the Superintendent of Statistics, this work of the Registrar-General, in classifying and dealing with the causes of death, has been an especially active cause in promoting the administration of preventive medicine and in bringing about that lessening of the death-rate which is so well known in this country. (Hear, hear.) Dr. Tatham's work has not only related to the classification of causes of death, but he has, of course, been concerned in the tabular statement, the grouping of facts in connection with those deaths—age, sex, diseases, and all the attendant circumstances that are important in showing them in their bearings. The tables that have been designed in Somerset House, the tables that have been published in the reports of the Registrar-General, sometimes with explanations, sometimes without, have taught us lessons that are of the first importance in understanding the circumstances under which mortality is being decreased and can be decreased. If I may take one table on a subject which has recently interested us all, I may say the tables relating to infant mortality have thrown more light on the subject matter than the majority of statistical publications. Then Dr. Tatham—I am not going through the long list of maladies he has discussed and the inferences he has drawn from them—has had to discuss other subjects as well. He has had to discuss the birth-rate, and I may say that some of the observations that have been made, and the way in which the statistics have been collected and arranged, have let much daylight into that very great subject. Statistics of causes of death are, as I say, of primary importance for our work, but it is a somewhat remarkable thing that when the system of registration was first proposed to Parliament it was not intended to include any

requirement that the cause of death should be shown. I think I am right in saying that it was only when the Bill came to the House of Lords that the cause of death was required to be inserted, and the Bill was then referred back with this amendment for the Commons to debate, and so the cause of death came to be included in our national statistics. (Laughter and applause.) Gentlemen, I am not here to make a political speech, but I do think we may say with regard to this: "Thank God there was a House of Lords!" (Laughter.) Well, we know that certification of death by medical practitioners was not at that time required. I think it was only about 1874 that certification of death became obligatory, but it is due to the profession to which I and so many others here belong to say that long before that Dr. Farr had approached the President of the Royal College of Physicians, the President of the Royal College of Surgeons, and the Master of the Society of Apothecaries, and that they had all agreed on their own behalf, and had urged their colleagues to adopt the same course, to certify the cause of death in any certificates that were written. In that way, long before there was any statutory obligation of the medical certification of the cause of death, English statistics began to include this information which we now find invaluable. So that in 1874, when this requirement became obligatory, Parliament was only confirming what our profession had enacted a number of years before. (Hear, hear.) One of the subjects which attracted a good deal of the attention of our profession years ago, and has attracted a good deal of the attention of the Society of Medical Officers of Health, was the necessity for knowing not only all deaths which occurred but also illnesses which occurred. Some very excellent work was done by the Society of Medical Officers of Health in the early days, and I think it would have been a good thing if it had been continued. But there were difficulties in the way and it was dropped. The subject had been discussed by many. Mr. Charles Paget, medical officer of health of Northamptonshire, has written an excellent work on what he calls the waste of records of disease. Dr. Tatham also directed his attention to this matter, and he took up the subject of notified infectious diseases. While he was medical officer of health of Manchester he made arrangements with other medical officers of health to send him weekly statements of infectious diseases which were notified in their districts. This they did, and he embodied them in a sheet of his own preparation, which he distributed to all contributors who had supplied information. Now in a way I can say that Dr. Tatham constituted himself Registrar-General of Infectious Diseases, and he had certainly made the beginning of a work which, for all I know, may be largely

extended in the future. Later he got a still better opportunity. When he became Superintendent of Statistics at Somerset House he was able to represent to the Registrar-General the desirability of including in the published returns of that office such information as could be got from I don't know how many districts—but I know he had the London figures; and they have appeared in weekly and quarterly returns issued by that department ever since. The Local Government Board, when he went to Somerset House, recognised the value of the work he had been doing, and that Board took over from him at that time the work of receiving returns from medical officers of health, collecting them together and re-issuing them among the contributors. I get every week a return from the Local Government Board which gives me information of the number of cases of the several infectious diseases which occur in something approaching 300 different communities, and which, I think, represent a population of some twenty million persons. (Hear, hear.) That is a system the inception of which, the development of which and the success of which we owe to Dr. Tatham. (Applause.) Well, Dr. Tatham has been at Somerset House, as I say, at a time when there were great changes and great developments in medical knowledge, and I need not say that he is essentially a student, that he has amply kept pace with the growth of medical knowledge, and has kept the best medical knowledge available for the use of the Registrar-General and for the use of that office. Of course, alongside the growth of medical knowledge has come what I may call a relatively new branch of work—the use of statistical methods in the investigation of the causes of disease, and especially of the natural history of disease. Now, work of the first character—work which has distinguished this country and, as far as I know, has never been done in any other country—has been done by a few Englishmen who have used the statistics which Dr. Tatham has been preparing of infectious diseases, and who have drawn inferences from them, some of them tentative (I should think most of them tentative), but which throw considerable light upon the behaviour of those maladies. Dr. Longstaff is a conspicuous example; Dr. Whitelegge, who is on my right, is a conspicuous example; and a third conspicuous example, Dr. Newsholme, is on my left to-night. (Applause.) All statistical data contain an element of error. We medical men know what the word diagnosis means; it means the best guess you can make under the circumstances. (Laughter.) Diseases are diagnosed, and Dr. Tatham and the Registrar-General have to accept those diagnoses, which, when not based upon a post-mortem examination, must in many instances be inaccurate. Now these errors are, of course, inherent to the circumstances of our

times. As medical knowledge grows new methods of investigation come along and the statistics will improve. They have improved very largely and are far more reliable than they were. At Somerset House they have a system of correcting for certain classes of error, especially errors due to fashion, and this is necessary, because fashion largely governs the disease of which people die. (Laughter.) I know, as a matter of fact, that something like five thousand letters are written every year to medical practitioners asking them for further information as to the cases for which they have given certificates with a view to making the records as accurate as they possibly can be. Again, alongside the growth of medical knowledge, alongside the improvement of the records of Somerset House, has come a new method of the application of statistical methods to the investigation of the etiology of disease. The most important is, no doubt, that of Karl Pearson. His method has instituted a very considerable advance in expressing in more precise terms the relations of various phenomena concerned in the production of disease to each other. And now I want to say one word—I must be forgiven if I appear to digress—of the extreme importance which attaches to those of us who are working, trying to investigate disease by statistical methods, that we should not attach too much importance to a high correlation between two phenomena. It is perfectly clear that two phenomena may have this correlation, but it does not follow that the one is the cause of the other. It may be, and I am sure very often is, that they are dependent upon some third phenomenon that is influencing them both. I am mentioning this because I feel the need of caution myself, and because I see in the work of my friends a growing interest in statistical methods, and I cannot help thinking that we want this caution in not being too sure of the inferences that may be drawn from high correlation co-efficients. I may take perhaps, as an illustration the attractive subject of flies and diarrhoea. (Laughter.) I hope I am not getting too technical but I may claim this, that if flies and diarrhoea rise and fall synchronously, if the curves fit each other, it does not follow that the one causes the other; they may be related to heat, which has produced them both. There is no doubt a great fascination in figures, and the more we know those figures are reliable the more we feel disposed to use them and to depend upon the conclusions to which they point. There have been some amusing and grotesque uses of figures. I can remember in my boyhood the story that an eminent person, influenced by the number 666, went so far as to take in coals by the sack on account of his expectation of an early millenium. (Laughter.) I think it is Henry Kingsley who tells the story of some traveller who

goes to Australia and comes across a tribe that can only count up the first few figures, and uses the number 84 for a description of any figure above half-a-dozen or so. The traveller having stated this, a missionary who was with him at once saw the explanation of the figure 84. He saw at once you had only got to multiply the twelve tribes of Israel by the seven cities of refuge and there you were. (Laughter.) But, unfortunately, the traveller found he had made a little mistake; it was not 84 the native tribe used but 94. Of course, the missionary was at a little disadvantage, but a friend came to the rescue and pointed out that this only made the matter more conclusive. You had only got to add in the Ten Commandments and you got the result. (Renewed laughter.) There are, there is no question, fallacies in the use of figures, but if there is one man who has steered clear of fallacy, and who has steered clear of the misuse of figures, it is Dr. Tatham. In all his writings I believe it will be found, as time grows and knowledge increases, that no man has less to unsay or say differently than Dr. Tatham himself. (Hear, hear.) So we have to thank him not only for statistics that are useful to us for our own inferences, but for his inferences, drawn therefrom with commendable care and caution. (Hear, hear.) I am not going to refer to all Dr. Tatham's work, but we must remember the decennial supplements that he wrote. He was concerned with the preparation of two, and very heavy labour it must have been. He has largely increased our knowledge of the mortality from different occupations, and has provided for Dr. Whitelegge invaluable material which he is successfully using for lessening the mortality from the different employments. I want to say just two or three words on Dr. Tatham's earlier life. It has been for some time the practice of Government departments to recruit themselves from men who have engaged in local service—that is to say, in so far as public health work is concerned, and probably in some others. Dr. Ogle was himself a medical officer of health. The Local Government Board had as its first medical officer Sir John Simon. A little later they had Sir George Buchanan who came from St. Giles. So the Home Office has taken Dr. Whitelegge, the Board of Education Dr. Newman, and the Local Government Board Dr. Newsholme, Dr. Franklin Parsons, Dr. Thomson, Dr. Bruce Low, Dr. Fletcher, and a number of officers who have rendered, and are rendering, distinguished service to the Crown in the work they are doing. So Dr. Tatham was taken from being medical officer at Manchester. His work as a statistician was already known before he went to Somerset House: his life-table for Manchester was the first extended life-table published for any local community. Then Dr. Tatham has sat on the

Council of the Royal College of Physicians, and has done valuable work in connection with his classification of disease through that relationship. He is chairman of the Statistical Committee of the Cancer Research Fund, and he has also been a member of the Departmental Committee dealing with Physical Deterioration. I believe that Dr. Tatham, through his touch in those days with activities outside the General Register Office, has strengthened and added to the success of the work he has undertaken in that department of the Government. He has always been not only the servant of a public department but a public servant in the widest sense. Speaking for myself, he has almost made me think I had a right to his assistance if I wanted it. At all events I never sought it without receiving it, and my experience has been practically a universal one. (Hear, hear.) Dr. Tatham's time in this office has come to an end, or is very shortly coming to an end. I am sorry to say that the time of our Registrar-General is also coming to an end. Sometimes I think that it is a great loss to the State that a fixed age should determine the retirement of its officers in so precise a way as it does, but there is one good thing about it: officers who have worked for the State in so successful a way as those I have mentioned have by no means finished their work in life, and thus, relieved from the cares of State, I am hoping to see Dr. Tatham develop some of his earlier writings. (Applause.) Dr. Tatham is going to be succeeded by Dr. Stevenson. I want to say that we who know Dr. Stevenson look upon him as a very worthy successor to Dr. Tatham. (Hear, hear.) As far as I know, Dr. Tatham's official life has been a very happy one. Of course, true happiness is not always to be found. There is a story told—I think it is by the writer of that charming story of Elizabeth in the Island of Rügen—of two pessimists, one of whom says to the other that only those are truly happy who are destined never to be born, and the other replies, "Yes, that is indeed so, and how few there are of them!" (Laughter.) I am not able to state whether Dr. Tatham would prefer to exchange the pleasure of his official life for the joys of those destined never to be born; but I may say that Dr. Tatham has told me over and over again how very happy he has been with his beloved chief, Sir William Dunbar, and when we know how necessary it is that an officer who is to do successful work should have a happy environment, we feel we owe to Sir William Dunbar our sincere thanks. There is no doubt that the relations which have existed between Dr. Tatham and his chief have largely contributed to the excellence of Dr. Tatham's work. (Hear, hear.) I have nothing more to add, except that I will ask you to drink Dr. Tatham's health. I will confess I have felt a difficulty in discussing him

to-night, because he is such an old friend of mine that I have been afraid I should give undue prominence to the personal element in Dr. Tatham and not sufficiently emphasise the value of his work as Superintendent of Statistics, and I know he has lived for his work. But if I have not referred to his personal and official qualities in due proportion I will ask you to forgive me. I give you, gentlemen, the toast, which includes both—"Dr. Tatham, the Superintendent of Statistics." (Applause.)

The toast was drunk to the refrain of "For he's a jolly good fellow!"

SIR WILLIAM DUNBAR said he was in the position of one seconding the motion. He was very glad to be there to meet the medical profession, because he would like to return his grateful thanks for the way in which they had helped him in his work as Registrar-General. Sir Shirley Murphy had sprung upon him that he was to follow his "little speech," but he had made a very fine oration, and he had told them of all the worthy, useful, not to say remarkable services which his friend Dr. Tatham had performed in his life. He was very happy to affirm what Sir Shirley had said, and also to say that the seven years he had spent at the Registrar's office had been made very much happier and much pleasanter by having such an able officer as Dr. Tatham under him. He had no hesitation in saying that when he was sent suddenly to the Registrar's office—he might say against his own wishes—he could hardly have finished the report of the last census without Dr. Tatham's assistance, and without the assistance of Mr. Humphreys and also of another gentleman who was then present—Mr. Waters. He (Sir William) was not a statistical man, and therefore he would not be doing himself justice if he took the responsibility of having written the census report of 1902. Not only had those gentlemen helped him in that work, but they had helped him most loyally throughout his time, and no one more loyally than their friend and guest of that night. He was glad to feel that whatever views the medical profession might have had when he (Sir William) went to the Registrar's office, they had now forgiven him for his inefficiency in the work since he had been there. He had done his best to perform his duty. He found the work there much more interesting than he expected it would be, and he thought it was much more in touch now with other Government departments—through the assistance of Dr. Tatham—than it was when he went there. As they knew, the department was isolated in the Strand, and unless they were brought into touch with other departments they could not do the work in the same efficient manner. He did not want to touch on knotty points of infantile mortality and birth-rates. He would only say that he did not share the fear

of a great many people that we were going downhill with regard to the birth-rate. He thought the birth-rate would presently show an increase; at all events the death-rate was showing a decrease. He regretted the retirement of Dr. Tatham from the public service, and he was sorry the public should lose the service of such an accomplished servant. Sir William concluded his remarks by giving a quotation from a poet who is not so well known in this country as he ought to be—Adam Lyndsay Gordon, the Byron of Australia, who rose to poetic fame by writing "How we beat the favourite." The quotation runs as follows:—

Life is mostly froth and bubble;
Two things stand alone:
Kindness in another's trouble,
Courage in our own.

"The last two lines," said Sir William, "are particularly applicable to my friend the guest of the evening." (Applause.)

DR. TATHAM, on rising to reply, was received with much enthusiasm. He said: I think you will sympathise with me when I say I am really oppressed by the more than kind words which have fallen from our chairman and from Sir William Dunbar. I had no idea when I came into the room that I should be made the subject of so many kind words. I am quite sure that in both instances they were sincere, and I am sure, too, from the way in which you have received those words, that you fully endorse them. (Applause.) I want to thank you, my friends, for coming here to-night to wish me a kindly farewell on my leaving the Civil Service of England. When I look round and recognise so many friends and so many colleagues, when I realise the import of their presence here to-night, you will, I hope, believe me when I say that I never knew I had so many sympathisers as your presence here proves to me that I have, especially in circumstances which you will understand to be in some respects painful to myself. I am sure that I owe the honour you have done me here certainly not to any merits of my own—(No!)—but I feel that I owe it to the genuine kindness of feeling and the genuine sense of comradeship which has existed between the members of the medical profession, the members of the public health medical profession, and myself, during the whole of my connection with Somerset House. Speaking to a company so largely composed of my own colleagues in the public health service, I should like to emphasise one fact, and it is this: that although the last sixteen years of my life have been spent in a Government office, my actual work has been simply an extension, or an expansion over a larger area, of the public health work which for more than twenty years previously had occupied my time in Lancashire. Having lived for nearly a

quarter of a century in Lancashire—which I always regard as my own county, for although I was not born there, my ancestors came from the manor of Tatham, near Kirkby Lonsdale—having lived for nearly a quarter of a century in Lancashire, where my family and I have enjoyed the intimate companionship of many dear friends, most of whom have passed away, and where I was myself privileged to enjoy the hearty friendship of the members of my own profession and of the staff of the University upon whose Senate I served during the whole of my residence in Manchester, you will readily understand that I did not sever my connection with my old county without much searching of heart. When I left Manchester—a step which I took in 1893 after consultation with my friends there—it was with the conviction, which has since been fully realised, that my work at Somerset House would have very definite relation to the national public health, and would consist in the application of the two-foot rule of statistical methods to the study of etiological problems, and to investigations into the distribution and fatality of disease. As to how far I have succeeded and to what extent I have failed in my attempts to aid my medical brethren in the public health service, as well as to add something to the stock of our knowledge respecting the causes of mortality, it would ill become me to speak. I think, if I may be permitted to say so, that both of my friends here, Sir Shirley Murphy and Sir William Dunbar, have spoken too appreciatively of my humble efforts—(No!)—and I feel that if I had my time to go over again I would try to increase the intensity of those efforts and to do my work more efficiently. However, that is by the way. In this connection I must say—although, speaking in his presence, I do so with some delicacy—that any success I may have achieved has been very largely due to the cordial help, advice and support I have at all times received from my respected chief, the Registrar-General of England. (Applause.) Sir William Dunbar has added to his many kindnesses this latest and characteristic act of his in being present to-night to wish me god-speed in my future life. (Applause.) Words fail me, and I am not able to express to you a tithe of my indebtedness to Sir William Dunbar for his kindness and for all the generous assistance I have received from him during his seven years' service as head of the office—a period which I am confident will go down in the annals of the department as one of conspicuous ability and self-denying devotion on his part to the highest interests of the public service. Speaking of the question of vital statistics, with which, of course, my official life has been so intimately concerned, I am not at all ashamed of the vital statistics of England as now published by the Registrar-

General. (Hear, hear.) Far be it from me to say that those statistics are perfect. They are nothing of the kind. They are as good as can be made in present circumstances, but I speak to gentlemen to whom the whole subject is quite familiar, and they know that they are and must be, in present circumstances, defective. Take the case, for instance, of a child brought to the out-patients' department of a hospital and seen by the physician or surgeon very probably on two occasions only. He has got to certify the death of that child. Well, although the physicians and surgeons attached to our great hospitals are men of the very highest ability. I think that any one of them, if he were present to-night, would say in regard to any certificate he may have given: "I have done the best I could. I have given the cause of death to the best of my opinion. In the absence of a post-mortem examination I cannot guarantee it. I give you my certificate for what it is worth. I can do no more." Well, we must accept the certificates for what they are worth, and I am bold enough to say that they are worth a great deal, and I say so after sixteen years' experience of certificates as they pass through the Registrar-General's office. In the course of my duty I have written some 4,000 or 5,000 letters every year to medical men in order to clear up difficulties in diagnosis, and I am bound to say to you that almost without exception the answers I have received have been not only most courteously worded, but have been distinctly helpful, and that by these means the registers of mortality have been considerably improved. That they are not perfect I have owned. I am sorry to say it is so, but I make bold to say that, compared with the statistics of twenty years ago, they are incomparably better; and I go further and say that they will bear very favourable comparison with the vital statistics of any foreign country. (Hear, hear.) Dealing as one has to do with the abstraction, classification and tabulation of more than half a million of deaths every year, and with writing appropriate comments on those deaths, to say nothing of the preparation for and the actual taking of the decennial Imperial Census, and the production of reports thereon, it goes without saying that no one man, however able, could have succeeded single-handed in such an undertaking. My friend Mr. Waters—(applause)—who for many years was my ablest colleague, and who since his promotion has been my most constant and kindly adviser, will confirm what I have said on that point. I am thankful and proud to record that I have always received from every member of my staff their loyal and continuous co-operation and support. I most sincerely hope that in the hands of my successor the vital statistics of England will be improved. They are capable of improvement. I hope they will be

improved, and I hope that my successor's relations with medical officers of health and with the medical profession generally will be as happy and as much to the advantage of the public service as my own have been. (Applause.) Sir Shirley Murphy, Sir William Dunbar and gentlemen, I thank you from my heart. I will not inflict on you any more words, but I thank you very heartily indeed for your kindness. (Applause.)

DR. WHITELEGGE proposed the health of the Chairman. They all knew, he said, that the polished productions of Somerset House had many facets. The one that had shed most light in his direction of recent years had been that which dealt with statistics of mortality according to occupation. He would like to dwell upon the enormous and increasing value they were to them and the magnified value they had had in Dr. Tatham's hands. They had to thank their Chairman for bringing them together that night and for expressing so ably and fully what they all felt in regard to Dr. Tatham.

Sir Shirley Murphy's health was cordially drunk, and this concluded the proceedings.

REVIEWS.

THE PUBLIC HEALTH AGITATION, 1833—1848.
By B. L. Hutchins. London: A. C. Fifield.
Pp. 150. Price 2s. 6d.

The great pioneers in public health reform have been strangely neglected by a public which to a large extent lives because of their labours. The greatest of them, Edwin Chadwick, is still without a biography, although nearly nineteen years have elapsed since his death. "Had he been a successful soldier or schoolmaster," Miss Hutchins remarks, "or a minor light in the Oxford Movement, no doubt he would long since have been celebrated in bulky and enthusiastic tomes." It is to be feared, indeed, that not a few of those engaged in public health administration are but imperfectly acquainted with the chief events in the careers of their distinguished predecessors. In the present volume Miss Hutchins has set out to praise these famous men, and she has succeeded in producing an exceedingly interesting and enjoyable book which no medical officer of health should fail to read.

Three chapters are devoted to the stormy career of Edwin Chadwick, which came to an untimely end in 1854, when he was ejected from office by an ungrateful country that could find no use for his extraordinary ability and untiring zeal. Chadwick's public health activities were restricted to the field of external sanitation, and he made no attempt to deal with the purely medical side of the work. In this he was largely followed by Southwood Smith, another pioneer of whom

Miss Hutchins gives a sympathetic account. But with Simon and Rumsey public health became concerned with questions of personal hygiene. Rumsey criticised Chadwick's sanitary movement on the ground that it relied too exclusively on mechanical means, such as drainage and the removal of nuisances, and he advocated the establishment of a system of "well-organised domiciliary visitation to be performed by a medico-sanitary staff, whose duty and interest it would be to raise the standard of health in their respective districts." He urged the importance, from a public health point of view, of an efficient system of medical relief for the poor, and he anticipated some of the suggestions contained in the Minority Report of the Poor Law Commission.

Kingsley and Slaney conclude the list of reformers dealt with in Miss Hutchins' valuable and suggestive book, which we can confidently recommend to all who are interested in public health work.

SCHOOL HYGIENE. By Robert A. Lyster, M.D.,
County Medical Officer of Health, Hampshire.
Second edition. London: University Tutorial
Press. Pp. VI.—388. Price 3s. 6d.

The introduction of medical inspection has brought teachers into close co-operation with the school doctor, and it is now more than ever important that they should be well informed as to the principles of school hygiene. This information Dr. Lyster's book is written to supply, and the appearance of two editions within a few months is a proof that it has been found serviceable by those for whom it is intended. The immediate success of the book is not surprising, for in scope, method and treatment it is admirably adapted to convey to teachers the kind of information they must possess if they are to take part creditably in the work of school hygiene. Dr. Lyster has wisely avoided burdening his pages with anatomical and physiological details, and he includes only such facts as are necessary for the appreciation of hygienic rules. The book consists of three parts. The first part relates to the school building, and deals with questions of site, construction, lighting and heating, ventilation and sanitary appliances. The second part is devoted to the physical training of the scholar, posture, eyesight and personal hygiene generally. The third part deals with medical supervision and school medicine and surgery. The book is practical throughout; the information is presented in clear, emphatic language and with no tendency to avoid the dogmatism that is necessary in an introductory text book. Unlike most of the leading authorities on school hygiene, Dr. Lyster appears to favour the routine disinfection of schoolrooms, which he states has led to a considerable decrease in infectious disease. He, however, omits to give the

facts upon which this statement is based, and we think that most workers in school hygiene prefer fresh air and cleanliness to chemical disinfectants. A schoolroom that requires routine disinfection can neither be clean nor well ventilated.

TUBERCULOSIS IN INFANCY AND CHILDHOOD: ITS PATHOLOGY, PREVENTION AND TREATMENT. By various writers. Edited by T. N. Kely-nack, M.D., M.R.C.P. Pp. XIII.—376, with 27 illustrations. London: Bailliere, Tindall & Cox. Price 12s. 6d. net.

In this volume the various questions relating to tuberculosis in infancy and childhood are discussed by no less than forty-one contributors, amongst whom are found many of the leading authorities in Europe and America. The whole subject of tuberculosis in early life is treated from many points of view. Dr. I. W. Ballantyne writes on the ante-natal aspects of tuberculosis, the question of milk-borne tuberculosis is dealt with by Dr. J. S. Fowler and Dr. Nathan Raw, and the relation of school hygiene to the disease is discussed by Dr. J. Edward Squire, Dr. Leslie Mackenzie, and Dr. Hally Meikle. The Editor may be congratulated on having secured the collaboration of so many distinguished contributors, who have enabled him to bring out a very valuable book which will be found useful by all students of tuberculosis.

BY-LAWS AS TO HOUSE DRAINAGE AND SANITARY FITTINGS MADE BY THE LONDON COUNTY COUNCIL. Annotated by Gerard J. G. Jensen, C.E. Second edition. The Sanitary Publishing Co., Ltd. Price 3s. 6d. net.

The second edition of Mr. Jensen's admirable little handbook to the drainage by-laws of the London County Council contains the by-laws made in 1903 that require plans to be deposited with the sanitary authority, and as difficulties have been experienced by builders and architects in preparing the drawings required, the author has included in his volume specimen plans and sections in the hope that they will be found useful as guides. Mr. Jensen's book is well known in London public health offices, and it is a model of its kind. The illustrations are numerous and helpful, and the by-laws are explained with a clearness and precision that leave nothing to be desired. We can strongly recommend the book to all who as sanitary officers, or in any other capacity, are brought into immediate relation to drainage by-laws.

CLEAN WATER AND HOW TO GET IT. By Allen Hazen. New York: John Wiley & Sons. Pp. X.—178. Price \$1.50.

In this book Mr. Hazen discusses the methods adopted by the chief American cities to obtain

a sufficient and suitable supply of water. He deals with the subject from the engineering and financial as well as from the public health point of view, his object being to lay down the principles that should guide a large urban community in providing a good water supply. The book is not intended for experts, but for the ordinary city councillor, and is written in clear non-technical language. It is well illustrated, and gives an interesting account of a very important subject.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856. RECONSTRUCTED 1888.
INCORPORATED 1892.

North-Western Branch.—Minutes of a Meeting held at the Victoria Hotel, Manchester, on Friday, May 21st, 1909. *Present*:—Dr. W. M. Hamilton (in the chair), Drs. Garstang, Sergeant, Kingsford, Hawksley, Welsh, Hibbert, Greenwood, Arnold, McMaster, Daley, Holt, Brindley, Moffatt, Hitchon, Wheeldon, Buchan, Paterson, Dearden, Fraser, Harper, and Barlow (Hon. Sec.).

The answers received from the various members of the Branch to the queries with respect to midwives for the information of the Departmental Commission were reported, and it was resolved to forward the same to Dr. Priestley for transmission to the Commission.

The nomination of Dr. Gibb Glass, Assistant M.O.H., Burnley, which was deferred from the previous meeting, was discussed at length, and after hearing the reports of the President and Secretary, and an explanation of the circumstances from Dr. Holt, it was unanimously resolved on the proposition of Dr. Dearden, seconded by Dr. Barlow, "That Dr. Gibb Glass be nominated for election as a Fellow of the Society."

Arising out of this matter the following resolution was passed unanimously:—

"That it be a recommendation of the North-Western Branch to the Council of the Society to take into consideration the question of what should be the minimum salaries which should be offered to School Medical Officers and Assistant Medical Officers of Health, and to further consider what action, if any, should be taken by the Society with respect thereto."

Three resolutions submitted by the Council for consideration by the Branches were referred to a committee for report at the June meeting.

DR. KINGSFORD then read a paper on "Personal Contact in Relation to the Spread of Infectious Disease in Schools." In the discussion which followed, Drs. Buchan, Moffatt, Brindley, Sergeant, Barlow, and Greenwood took part, and a hearty vote of thanks was accorded to Dr. Kingsford at the close.

Southern Branch.—Minutes of Meeting held at the Corporation Abattoir, Brighton, on May 28th, 1909. *Present*:—Drs. Lauder (President), Courtauld, Forbes, Gibson, Griffith, Lyster, and Willoughby, with Dr. Rhodes as visitor.

The first business was the consideration of the resolutions referred to Branches by the Parent Society. It was resolved as follows:—

1. "That this Branch supports the suggestion of holding the ordinary meetings of the Society in the afternoon."

2. "That the Branch considers it desirable that books should be lent to Members from the Society's Library; and suggests that the library be catalogued and re-arranged for the purpose."

With regard to reference (3), concerning the formation of a Veterinary Service and of Government Regulations for Cowsheds, the Branch considered this of such importance that it was postponed to allow of a full discussion at a later meeting.

DR. COURTAULD (Assistant M.O.H., Brighton) then read a paper on the origin and development of the abattoir, of which the following is a summary:—

The abattoir, opened in 1894, contains one public slaughter-house for beasts and sheep and one for pigs, with hanging rooms adjoining—all fitted with hoisting and travelling gear. The lairs are at the back. There are also three private slaughter-houses for beasts and one for pigs; a tripery for public use; rooms for the superintendent, master butchers, and men; and a dock for cattle.

The fees charged are less than in some towns, being 1s. for beasts, 2d. for sheep, 4d. for pigs, and 6d. calves.

The staff employed to look after it consists of one superintendent sanitary inspector, one assistant ditto, and two labourers.

The cost of building, apart from land, was £12,047. The expenditure per annum, apart from repayment of loan, is about £1,000, and the receipts £500.

The private slaughter-houses in the town have been reduced since its opening from fifty-eight to thirty-three. At present out of 70-80,000 slaughterings per annum, 25,000 are at the abattoir; nine-tenths of all pigs are killed there.

The reasons urged against its use are—

1. That the butchers get to know too much of one another's business.
2. That the delay in getting meat to shops makes it appear less fresh.

The actual advantages to the town are—

1. Nuisance of pigs being killed near houses is avoided.

2. One-third of all meat is thoroughly inspected.

An interesting comparison was made of the proportion of diseased meat found at the abattoir and at private slaughter-houses in the town—being in all cases more at the abattoir. This is so partly because when the butchers get a doubtful beast they prefer to take it to the abattoir rather than risk the diseased meat being found on their premises.

Tuberculosis was responsible for 46 per cent. of all disease in beasts and for 37 per cent. in pigs.

The Local Government Board regulations as to what to condemn were followed for cattle, but not for pigs, in which if only the head glands were affected, the rest of the carcass was passed as good.

After a discussion of the points raised by the paper, an inspection of the premises was made, in which an excellent collection of specimens of meat, mostly tænia and tuberculosis, had been arranged. The members then visited the refuse destructor and the sanatorium, where, after tea, the methods of treating consumptives were explained.

Yorkshire Branch.—A meeting of the Yorkshire Branch was held at the County Hall, Wakefield, on Friday, June 11th, 1909.

The President (Dr. Neech, of Halifax) occupied the chair, and there were also present Drs. Adam (Wakefield), Bampton (Ilkley), Brewer (Sandal), Burman (Wath-on-Deane), Spottiswoode Cameron (Leeds), Katherine J. S. Clark (Castleford), Clements (Batley), Catharine L. Corbett (Mexborough), Josephine Coupland (Leeds), Coplans (Leeds), Arnold Evans (Bradford), Gibson (Wakefield), Halliwell (Dewsbury), Johnstone (Harrogate), Langdon (Wakefield), Macdonald (Huddersfield), Elizabeth M. McVail (Sowerby Bridge), Mason (Harrogate), Moore (Huddersfield), Nightingale (Horsforth), Orr (Wakefield), Smith (York), Stansfield (Clayton), Sutherland (Cleckheaton), Templeton (Doncaster), Williamson (Sandal), Mitchell Wilson (Beverley) and J. R. Kaye (Wakefield), hon. sec. The following visitors attended the meeting: Drs. Jubb (Barnsley), McCade (Huddersfield), Mill (Ossett), and Garrick Wilson (Sheffield).

The feature of the afternoon was a demonstration of the more recent methods of bacteriological diagnosis, by Dr. Thomas Orr, of the County Health Department. Dr. Orr divided the demonstration into four parts under the heads (1) *B. tuberculosis*, (2) *B. diphtheria*, (3) *B. anthracis* and (4) *B. typhosus*. Remarks were made in regard to diagnosis of the bacillus of tubercle, and the value of inoculation of animals. The significance of the opsonic index was also considered. *B. diphtheria* was compared with the bacillus of Hoffmann and

other diphtheroids, as regards morphology, sugar reaction and virulence. *B. anthracis* was considered in relation to human and animal infection, while the purple-red reaction was demonstrated.

The coli-typhoid group of organisms were fully considered. The isolation and identification of *B. typhosus* and the differentiation of the various coliform organisms was demonstrated by means of numerous plates and media.

The demonstration produced an interesting discussion.

A synopsis of the Tuberculosis Order, 1909, the Milk and Dairies Bill and the Moveable Dwellings Bill had been prepared by Dr. Kaye, the hon. sec., but the discussions thereon were postponed to another occasion.

The members were entertained to light refreshments.

LAW REPORTS.

HOUSE OF LORDS.

May 20th, 1909.

BEFORE THE LORD CHANCELLOR AND LORDS
MACNAGHTEN, GORELL AND SHAW.

JONES, BROOK AND BROTHERS, LTD., v. MELTHAM
URBAN DISTRICT COUNCIL.

Rivers Pollution Prevention Acts—Facilities to
Manufacturers—Sufficiency of Sewers—
Meaning of "Sewers."

A local authority is not bound by Section 7 of the Rivers Pollution Prevention Act, 1876, to give a manufacturer facilities for carrying liquids from his factory into the sewers of the district if the council's works for sewage purification are only sufficient for the needs of the district, although the actual sewer pipes may be sufficient to take the liquids of the factory.

This was an appeal from the Court of Appeal on the part of the plaintiffs, a firm of cotton-thread manufacturers. They began proceedings in the County Court for an order that the District Council should allow them to send the liquids from their manufactory into the Council's sewers. They contended that they were entitled to do this under Section 7 of the Rivers Pollution Act, 1876, provided the sewers were sufficient for the purpose in addition to the requirements of the district.

It was admitted by the respondents that their sewers—viz., the pipes or channels by which the sewage matter was conveyed to their outfall or purification works—were more than sufficient for the requirements of their district; but they contended that their outfall or purification works were sewers within the meaning of the proviso, and that such outfall or purification works as such were only sufficient for the requirements of their district, and were wholly insufficient for the purification of such liquids, or any part thereof,

in addition thereto. The County Court Judge held that the outfall or purification works were sewers within the meaning of the second proviso in the seventh section of the Act of 1876, and further held that they were more than sufficient for the requirements of the respondents' own district, but only to the extent of 20,000 additional gallons a day, instead of the 65,000 gallons per day as claimed by the appellants; and on the appellants declining an order limited to 20,000 gallons per day dismissed the cause with costs.

The Divisional Court, on appeal, reversed the judgment of the County Court Judge, but the Court of Appeal restored that judgment, holding that the County Court Judge was right. (See PUBLIC HEALTH, Vol. 21, p. 289.)

The appeal was dismissed.

THE LORD CHANCELLOR, in moving that the appeal should be dismissed, said that, in his opinion, the decision of the Court of Appeal was right. The seventh section of the Rivers Pollution Prevention Act, 1876, enabled local authorities having sewers under their control to give facilities for enabling manufacturers to carry liquids proceeding from their factories into such sewers. If the section were examined it would be found that these facilities were granted only by way of grace and favour. It was qualified by two provisos. In regard to the second proviso, he thought the sewers in this instance were only sufficient for the requirements of the district. The word "sewer" did not necessarily mean precisely what it meant in the Public Health Act, 1875. It included under the Act of 1876 the works in connection with the sewers forming part of the system by which fluids were enabled to pass to their ultimate destination.

The other members of the House agreed.

May 24th, 1909.

BEFORE THE LORD CHANCELLOR AND LORDS
MACNAGHTEN, JAMES OF HEREFORD, AND SHAW.

FERGUSON v. MALVERN URBAN DISTRICT COUNCIL.
Nuisance—Escape of Sewage—Pollution of Water
—Water from Defendant's Land—No Right
to Use Water—New Trial.

This was an appeal from a judgment of the Court of Appeal, reported in PUBLIC HEALTH, Vol. xxi., p. 210. The action was brought to recover damages for injuries caused by reason of an outbreak of typhoid fever at a hydropathic establishment belonging to the plaintiff. At the trial (reported in PUBLIC HEALTH, Vol. xxi., p. 86, where the facts are set out), the jury found that the defendant council had allowed sewage to escape into certain water which the plaintiff had used, and that this was the cause of the outbreak. They awarded him £7,500 damages, but they also

found that the plaintiff had no property in the water, which in fact belonged to the defendant council, and that he was using it without their permission. At the trial *Lawrence, J.*, entered judgment for the plaintiff for the amount claimed. The defendants appealed and the Court of Appeal entered judgment for the defendants. The plaintiff now asked for judgment or a new trial.

The appeal was dismissed, their Lordships being of opinion that nothing but further expense and annoyance could come from a new trial. The real question was whether the appellant had a lawful enjoyment of the water, and this the jury had negatived. Although the plaintiff had suffered damage they did not think there was any chance of establishing his case on a new trial.

KING'S BENCH DIVISION.

May 19th and 20th, 1909.

BEFORE COLERIDGE, J., AND A COMMON JURY.

LE MASSU AND WIFE v. COSSON.

Sale of Food—Warranty—Negligence—Alleged
Ptomaine Poisoning.

This was an action for damages brought against the defendant, a confectioner in Soho, on the ground of negligence, or in the alternative breach of warranty, in connection with the sale of cakes containing cream, the eating of which it was alleged had caused the plaintiffs to suffer from ptomaine poisoning. The defence was that the cakes were made of wholesome materials, and were good when sold.

The plaintiffs' case was that on Saturday, June 20th, 1908, the female plaintiff bought twelve cakes containing cream at the defendant's shop. They were taken home in a cardboard box and put in a box on the dining-room sideboard. At night the box, with the lid removed, was placed in the larder, in which were some vegetables and a chicken. The cakes were eaten next day at lunch by the plaintiffs and two gentlemen who lodged in the plaintiffs' house; the housemaid also had eaten one. All these persons were afterwards taken ill, the plaintiffs in the course of the evening, the housemaid during the night, one of the lodgers became ill in the afternoon and the other about midday on the Monday.

Evidence was given by two other persons of having bought cakes from the defendant on the same day and having been ill in consequence. The wife of one was taken ill after having eaten some of these cakes, and she subsequently died. At the inquest the jury found that death was due to ptomaine poisoning, but that there was not sufficient evidence to show how it was introduced into the system.

For the defence Mr. John Whipp, an inspector in the employ of the Westminster City Council, pronounced defendant's bakehouse as complying

with the Factories and Workshops Act. There was nothing to complain of in regard to it, and he had shown it to the medical officer of health and others as a model of cleanliness. Witness had never seen anything but fresh and wholesome materials in use. There was a proper, well-ventilated store, and the drains were sound.

The defendant said that she used only cream, eggs, butter, flour and milk, and nothing tinned. She paid the best prices for the materials. She got her milk and cream fresh twice a day. She baked 500 to 600 cakes a day on a Saturday and Sunday, and she never sold any which had been made the day before. When she sold the cakes to plaintiffs they were fresh and wholesome. Cream cakes, if kept as Mrs. Le Massu kept those she bought, might go sour.

Evidence was also given of other persons who bought and ate cakes on the same day and suffered no ill effects.

The jury, after two hours deliberation, stated that there was no prospect of their being able to agree. They were in consequence discharged.

RECENT PUBLIC HEALTH LITERATURE.

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SOME CONDITIONS OF SOCIAL EFFICIENCY IN RELATION TO LOCAL PUBLIC ADMINISTRATION.

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ALTHOUGH in matters of morals, as well as of personal health, introspection is apt when carried to excess to exert a morbid influence, historically elevation of the moral standard of life has accompanied the phases and periods of religious life in which conscious experience and introspection have been prominent. And I think we have reasonable grounds similarly for expecting that the introspection manifested in recent years in relation to our national education, to our industrial life, to our Army and Navy, and even to the right use of our national sports, may result in a real increase in the sum of our national efficiency. It is therefore with some degree of confidence that I venture in this address to indicate some among the obstacles to and aids towards increased efficiency in sanitary and other forms of local public administration. In doing so let me remind you that my words have no official or other authority except what may be indicated by their applicability to practical needs.

The possibilities of increased efficiency in local public administration are obviously concerned with improvements in our present imperfect methods of administration. They are also concerned with extensions of communal action. The latter may be considered first, as illustrating the principles of preventive medicine which should govern the supervision and control of communal life.

NEED FOR EXTENSIONS OF COMMUNAL ACTION.
With wider and more exact knowledge of hygiene, it is being increasingly realised that the whole range of the physical, mental, and to a large extent of the moral life of mankind

may be brought within the range of preventive medicine; and that as medical knowledge grows the number of diseases that can be regarded as preventible will increase, and public administration will extend beyond its present limits.

A wide outlook as well as a high ideal is needed if social amelioration is to be secured to the extent well within our reach. The social worker in local administration is concerned with the remedial treatment and prevention of all forms of distress, whether physical, mental, or moral; and these are so closely inter-related as not to be completely separable. There need be no other feeling than enthusiastic optimism, if we are willing, as we are able, to go up and possess the land.

The need for a wide outlook cannot too often be recalled to mind. A "Vision of the Whole," as it has been described by Bishop Westcott, is happily becoming a more general possession of social workers. There has been no more striking approach to it than in the Majority and Minority Reports of the Royal Commission on the Poor Laws, which emphasize the need for searching out and combating the causes of social evils. This method of approaching social problems will almost necessarily involve the general scrapping of some of our older social machinery, just as the advance of physical and chemical science necessitates the casting aside of obsolete machinery in the industrial world.

Instances of the need for this wider outlook will occur to all. Medicine itself furnishes too many instances of charlatans without exact knowledge, and of specialists who know something almost too well, while ignoring the relationships of their special knowledge to the patient himself. The medical specialist of the past who has been known to busy himself in treating a nasal polypus while his patient is dying of phthisis is paralleled in public health administration by the sanitary authority which,

while it spends money lavishly on an isolation hospital, neglects to search out, by bacteriological means or by systematic clinical inquiry, the "missed" cases which continue to spread infection, and which the arrangements for notification have not revealed. He has similarly been paralleled in police administration, which only in recent years has fully recognised its duty to prevent as well as to punish crime; and in poor law administration, which has been content to give either insufficient or redundant, because largely unconditional, doles to the impoverished.

We are now learning that the treatment of the under-fed and ill-clad child is part of a larger problem concerning the family and industrial conditions; and that alcoholism is a problem of domestic economy as well as of the number of public houses; of monotonous occupation as well as of conviviality; of "the shortest road out of Manchester" as well as of yielding to an insidious habit. Similarly the medical officer of health who is most successful in his work impresses upon all the local authorities—sanitary, educational, and parochial—of his district the inter-relation of their work, and calls to his aid the united effort of these authorities and of the numerous voluntary agencies who are seeking to remove the evils of municipal or domestic uncleanness, of overcrowding and defective housing, of insufficient and belated care of the sick, and to ensure the beneficial results obtainable from the best methods of education and recreation.

More accurate knowledge and a wider outlook will enable social problems to be seen more nearly in their correct perspective. This is particularly true of the more immediate problems of public health administration. Much of the extravagance of administration in the past has been due to a distorted perspective, though other factors have doubtless also been at work. If the avoidable loss of life and health from communicable diseases were realised by the members of sanitary authorities they would be less likely to build extravagant town halls while the water supply of the town is impure, or while privy middens and pail closets continue; or to provide municipal Turkish baths, as in some towns, while backyards and streets remain unpaved; or a town band while neglecting to teach school-girls domestic economy or school-boys such knowledge as will enable them to take a definite part in the adult life of the community.

And this more accurate knowledge and wider

outlook will mean the abandonment of the old hand-to-mouth and empirical method of dealing with social evils. The conception of poverty and destitution as an element, when it is in fact a complex compound, will disappear, and with it will disappear administration which supplies doles to relieve the symptoms of destitution, without making efficient efforts to investigate its varying causation and to initiate preventive measures against its recurrence.

REFORM BY PESTILENCE.

In the past failure in respect to measures for the public health has been the preliminary to success. Epidemics of infectious diseases have been the teachers of sanitary efficiency. Cholera in particular has been the greatest of sanitary reformers in this country, the panic produced by it having been in large measure the parent of our modern sanitation.

Devastating outbreaks of typhus fever were the immediate cause of the establishment of isolation hospitals, as well as of the demolition of many of the rookeries in which this disease lurked and spread.

It was the fear of further disease, and perhaps even more the desire to diminish the enormous poor-law burden involved in supporting the fever patients and those made widows and orphans by fever, that led to sanitary reform. But the lessons of monetary loss and of fear have not been completely learnt. The occasional occurrence of great outbreaks of enteric fever due to water contamination shows that the safeguarding of some of our water supplies is not yet perfect; the fact that enteric fever still prevails owing to the persistence in the eating of sewage-contaminated shell-fish shows that ignorance and carelessness in respect of the dangers of contaminated food have not disappeared; and the excessive mortality from diarrhoea and enteric fever associated with the continuance of privies and similar abominations in large towns in Yorkshire, Durham, Lancashire and elsewhere, indicates that many sanitary authorities are parsimonious in the discharge of their elementary duties, though often, alas! extravagant in less essential matters.

The direct attack upon tuberculosis has only now begun, and in regard to this disease we need to learn again the lessons taught to our parents by Southwood Smith, Chadwick, and their co-workers, that one of the chief causes of poverty is disease, and that extended public health administration must continue to be a chief means of removing destitution

from our midst. Disease and poverty alike teach us that we are members one of another, and that the welfare of the entire community can only be secured by securing the welfare of its weaker members.

THE CAUSAL ATTACK ON DISEASE AND POVERTY.

The one great principle distinguishing rational medicine from empiricism is that the former, while applying restorative treatment to the patient, endeavours to determine the causation of his disease and to prevent the continued operation of the causal agents. In the words of the legal maxim *melius est petere fontes quam rivulos sectari*. It is amongst causes that we find our means of efficient attack against disease.

Happily, the Poor Law Commission's Report indicates a wish to secure similar causal treatment for the evils which have destitution as their eventual issue. It is recommended that it should be an explicit instruction to committees to "decide upon the best method of assisting applicants with a view to removing the causes of distress."

The Commissioners lay stress, particularly in relation to pulmonary tuberculosis, on the frequent harm which is being done by the unconditional character of the grant, "which far outweighs any benefit to be derived from the dole of outdoor relief."—(Majority Report, Part IV., par. 264.)

Similarly in the Minority Report we read:—"With a few honourable exceptions, no attempt is made by the Destitution Authority even to ascertain how the household is actually being maintained upon the outdoor relief that is granted, still less to effect any necessary improvement in the home. The result, as we have grave reason to believe, is that a large part of the three to four millions sterling (now spent annually on outdoor relief) is a subsidy to insanitary, to disorderly, or even to vicious habits of life."—(Min. Rep., part I., chap. II., par. 5 of Conclusions.)

An optimistic social outlook is justified by the wish indicated in the preceding extracts, and in many other parts of the same reports, for a change from symptomatic to causal treatment in the therapeutics of the commonwealth as of the individual, and by the steps already being taken in this direction. It is not difficult, however, to quote current instances of inefficiency in nearly every branch of social work. Thus, in connection with the

problems of unemployment and under-employment, we have been content to allow a large proportion of the boys leaving school to engage in casual labour, as errand boys, messengers, etc., without insisting on their being trained for more definite and more permanent work in adult life.

THE SOCIAL STANDPOINT.

With a wider appreciation of the social standpoint implied in the causal attack on disease and poverty, the exploitation of children for the sake of an immediate return for their work, and of mothers at the expense of the health of the family, will no longer be permitted.

In regard to the terrible national waste of efficiency caused by alcoholic indulgence, there is quite as bad a national record. We are still willing to admit to and treat in the workhouse infirmary patients in their repeated attacks of delirium tremens without communal effort to compel the sobriety of such patients after their first attack, even though this may imply the need for preventing them from handling their own wages; and we are similarly still willing to clothe and feed the children of the chronic alcoholic "soaker," the only diversion of his wages being by way of occasional fines for drunkenness, which still further deplete the funds available for the children.

I need not illustrate, from the great social reform recently inaugurated, the medical inspection of school children, except to remark that unless by official or voluntary means, or by a combination of these, children now being found to be incompetent for their life work through adenoids or defects of eyesight or other conditions are treated, the inefficient workers thus left to accumulate at a future date will need to be supported.

It is right, however, that I should adduce my chief illustrations from the closely inter-related subjects of public health and poor law administration. I have already adduced the lethargy of many local authorities in preventing the spread and removing the causes of prevalence of communicable diseases.

EXTRAVAGANT PARSIMONY.

Tuberculosis furnishes another example in public health and in poor law administration of extravagant parsimony, which we may hope administrative action taken as the result of the tuberculosis order recently issued by the President of the Local Government Board will do much to end. When we remember that something like a fifth of the total

disablement of members of friendly societies at ages 15 to 65, and at least this proportion of the total claims on their funds, are due to tuberculosis, and that among men aged 20 to 65 in England and Wales on a very low estimate tuberculosis causes an annual loss of at least a million sterling in wages—without attempting any estimate of the cost of sickness—we obtain a glimpse, however imperfect, of the national loss caused by this disease. Disease is always more expensive than measures for its prevention, and this rule, based on experience, finds no exception in the case of tuberculosis.

The giving of insufficient outdoor relief, when outdoor relief is indicated, is another instance of an extravagant parsimony often affected by board of guardians. Perhaps the most familiar example of this form of mal-administration is that which drives the widowed and penniless mother of a young family to eke out her pittance by earnings which not only tend to prevent the sufficient payment of other workers but also expose her children and herself to the disease and inefficiency which inevitably follow in the track of chronic mal-nutrition.

It is easier, however, to enumerate evils than to apply their remedies, with a due regard to causation. We have to realise the close

INTERDEPENDENCE OF SOCIAL EVILS

which often form a vicious circle, where evil effects become in their turn sources of evil. This fact is occasionally mentioned as a reason for disheartenment or even despair. On the contrary, it often justifies the most hopeful optimism; for a circle can be broken at any elected point, which would naturally be that of least resistance. Bad housing, overcrowding, a comfortless home, or the desire to stand well with his companions, may all lead the man of weak will into alcoholic habits; and it is satisfactory to remember that his recovery may be aided or even secured by reducing the opportunities of temptation, by more rational provisions for recreation, by a different method of wage payment, or by ameliorative measures directed to the condition of his home. The fact that social evils commonly exist as vicious circles is an argument rather for solidarity of effort on the part of all voluntary and official workers, than for discouragement over the difficulty of the task.

I have already mentioned the premature employment of children and, worst of all, their employment at casual labour, which does not lead to their being prepared for adult work.

This is an excellent example of the vicious circle. Presumably the sole earnings of the father do not, in many of these cases, suffice for a normal standard of living of the family, and poverty, as well as social custom, is responsible for this early employment of children to the detriment of their normal growth and their efficiency in adult life. To remedy this state of matters we are driven to the alternative that either the standard of wages of the father must be raised, or there is the implied assumption that a father of a family must content himself with wages which suffice for himself, or possibly himself and his wife only, the maintenance of his family being a state concern!

Sir John Simon, in a remarkable chapter on the "Economics of Poverty," published in 1890, drew eloquent attention to the fact that "all labour below" (a given) "mark is masked pauperism," and he points the lesson in the following words: "It is the public that, too late for the man's health or independence, pays the arrears of wages which should have hindered this suffering and sorrow."

In view of the social difficulties of which an example has been given above—in which to secure better conditions of life, child employment appears to be necessitated, which in its turn causes the very evils of physical deterioration produced by underfeeding and overcrowding—we cannot be surprised that in all industrial countries communal methods of saving, such as old-age pensions and insurance against sickness and unemployment, are making rapid progress, as supplementary to or substitutes for individual saving.

Poverty itself is one of the most potent causes of poverty. This is well seen in the relation between distress and tuberculosis. It is probable that something like a third of all the deaths that oblige widows with children to have recourse to poor-law relief are due to tuberculosis. This is not the only destruction wrought by this preventable disease. There is commonly a legacy of disease as well as of poverty. The seeds of disease have been sown by the unhappy parent, and the conditions of poverty are just those which furnish the best soil for their germination.

ANALYSIS OF CAUSATION.

In preventive medicine, knowledge has passed through two stages. First emerged the crude idea that local insanitary conditions, irrespective of specific infections, caused epidemic diseases.

Under the influence of this doctrine were secured the earlier sanitary reforms in this country; and in view of the great results secured in the reduction of disease, it would ill become us to belittle the importance of this first approximation to truth. A more complete analysis of events, however, indicates that these reforms reduced disease even more by removing the germs of disease than by diminishing the susceptibility to their action; and as the light of experience has become brighter the need for medical organization of the treatment of the infectious sick as a means of preventing disease has become evident, as well as the need for the removal or prevention of nuisances. The same need is now being recognised in tuberculosis as well as in other infectious diseases.

In relation to the above diseases, the collective have gradually overshadowed the personal aspects of the problem; the dread of disease having been a more powerful motive than the fear of pauperization. For the individual this has meant the treatment and prevention of disease; for the community protection against infection, and protection against the inefficiency which is its most serious associate and sequel.

Nor can any sharp line of demarcation be drawn between the attitude of the community in respect of communicable and non-communicable diseases, the former being regarded as of communal and the latter as only of individual interest. Such a line was not drawn in the great Public Health Act of 1875. It has been ignored in the numerous industrial enactments against accident and occupational diseases; it is now being ignored in the activity of municipal and county authorities in attempting to secure diminished risk and suffering in childbirth under the Midwives Act, and a lowered infant mortality by means of the Notification of Births Act; and in the activity of education authorities to detect all evil conditions affecting school children, and to secure their removal. Social inefficiency is caused by every form of disease in proportion to its duration and severity. The prompt and early treatment of disease in its widest definition being one of the chief means for securing social efficiency, the better communal organization of the treatment of the sick from whatever disease must be regarded as a chief object of the preventive medicine of the future.

It is interesting to note how in the past environmental hygiene and the personal treatment of the sick, or of those who might become so, have in turn predominated in public

administration directed to the prevention of disease and poverty. Very early in public health administration the State arranged for the preventive treatment of small-pox by means of vaccination, and provided free treatment for patients suffering from cholera and diarrhoea.

The provision of hospital accommodation for cases of the chief infectious diseases has advanced with the improvement of general sanitation: and improved sanitary circumstances having, in large measure, been rendered possible for the entire population, our control over the conditions of personal hygiene is again gradually extending by means of the work of medical officers of health, health visitors, midwifery inspectors, medical inspectors of school children and school nurses, infant protection visitors, and others. Thus the social and the individual are inextricably interlaced, and a public health authority which is also an education authority may, for instance, be concerned with the treatment of a large number of diseases or even of accidents, with the training of children in the avoidance of mouth breathing, and with the prevention of overcrowding or the condemnation of insanitary houses.

THE COST OF INEFFICIENCY.

So far I have been concerned chiefly with indicating the enormous part borne by sickness in causing social inefficiency and with illustrating the importance of removing the causes of sickness, whether this implies merely the improvement of environmental conditions, or, as most often happens, also the prompt and efficient treatment of the patient himself.

About 30 per cent. of the total paupers under the care of boards of guardians are sick (report of Royal Commission on Poor Laws, part V., chap. III., page 289). The Commissioners add (part V., chap. III., paragraph 197):—

"We estimate that at least one-half of the total cost of pauperism is swallowed up in direct dealings with sickness. To this burden we must add the indirect contributions of sickness, viz., the widows, children and old people cast upon the rates through preventable deaths of bread-winners, and the host of degenerate, imbecile, maimed and blind, with whom disease helps to populate our work-houses. It is probably little, if any, exaggeration to say that to the extent to which we can eliminate or diminish sickness among the poor we shall eliminate or diminish one-half of the existing amount of pauperism."

At the present time we are spending about sixty millions sterling annually on our public

health, education and poor-law organizations. The enormous gains to national efficiency and the great economy of efficiency that are attainable would justify greatly increasing these closely inter-related branches of public expenditure: and no such expenditure in other directions would be equally fruitful in good results. Illustrations of the enormous national loss of efficiency caused by tuberculosis have already been given. Let me give one more for the same disease and one for enteric or typhoid fever. In the year 1907 the male deaths from phthisis in England and Wales numbered 22,647, which, on a very low estimate, implies a financial loss in a single year in respect of the estimated value of the lives lost* (making no allowance for loss from sickness and prolonged inability to work) of about 4½ millions sterling. During the ten years 1871-80 the corresponding loss was 49½ millions. If we assume that the annual loss in the ten years 1907-16 will remain stationary, that furthermore every death is associated with a year's disablement at £50 a year for those aged 15-65, and that every fatal case implies an expenditure on sickness of £25, then in the ten years 1907-16 the total loss will be 58½ millions. In 1871-80 on the same basis it was 66½ millions.

A similar calculation for enteric fever, with the assumption that each case of enteric fever costs £20 and that 10 per cent. of the cases are fatal, would show in the ten years 1907-16 (assuming a stationary condition between 1907 and 1916) a cost of £5,356,100 as compared with £12,754,026 in the ten years 1871-80.

In the case of phthisis a saving of 8½ millions, and in the case of enteric fever of 7½ millions in ten years is seen for male experience alone. On the two diseases together an annual national saving for males' lives only of more than a million and a half has already been secured. In both still further great economies can be secured, though the possibilities of useful work are greatest in respect of tuberculosis, in which the proportional saving hitherto secured is much smaller than in enteric fever.

It is sufficiently evident from these two illustrations that by combined efforts on the part of the community the total mass of poverty and sickness can be decreased, and that such efforts are not mere unproductive expressions of altruism. They represent, in fact, the best investment that the community can make. The provision, for instance, of the best hospital

* This is based on the very low estimates of the value of each life given by Farr many years ago.

treatment for such advanced cases of phthisis as are badly housed at home is as important and urgent a measure of public health as to repair a leaky drain or to empty an overflowing cesspool. Such expenditure is not a mere indulgence, however meritorious, of benevolence. It is, as Mr. Devine has put it in another connection, in reality a husbanding of forces, a capital expenditure on which a high rate of interest can be ensured.

THRIFT A CONDITION OF EFFICIENCY.

But although expenditure tending to diminish sickness is recouped manifold in increase of national efficiency, it is none the less true that thrift is a condition of efficiency. Thrift, however, is not synonymous with parsimony which refuses to make the expenditure needed for efficiency. Large expenditures in social improvement are the truest thrift when administration is conducted on sound business lines, and when the consciences of our local administrators are so sensitised that they become as judicious in communal as they are in personal expenditure.

PRINCIPLES OF ACTION.

The attempt made in the preceding remarks to set forth some general principles governing the search for social efficiency would be somewhat theoretical were I not to supplement it by advice as to principles of action and by instances of defects in our present administrative methods of action. I had hoped also to add a few remarks on means by which efficiency may be tested, but the length of my address under other headings will render this impracticable.

(a) The past teaches us plainly that we should cease to allow disease in general and pestilences in particular to be the finger-posts of progress. Health is always cheaper than disease, and without an efficient state of health progress in other social concerns is being constantly impeded. The importance of this primary fact is emphasised by the consideration that social causes are leading to a postponement of the commencement of remunerative work in the individual, and possibly also to its cessation at a somewhat earlier age than in the past. It should be added that while the old age for work is being anticipated the average age at death, on the contrary, is increasing.

(b) To secure either individual or social health the causes of disease must be attacked. Instances of the need for this have been already adduced. The examples given of the operation of the vicious circle indicate that, in view of

the complexity of social relations, a too pedantic view of causation must not be taken. Conditions of evil such as nuisances under the Public Health Acts carry with them the germs of disease. The extremely low standard of housing prevailing in many colliery districts implies not only excessive spread of infection in enteric fever, tuberculosis, and other diseases, but, being associated with a standard of wages which would permit much better housing, may imply intemperance or other habits which in themselves cause disease. It is difficult under such circumstances to state first causes for each case. I have already indicated that much of our sanitary reform was secured before the causes of communicable disease were so well known as now, but that the precision of our measures against disease has become greatly increased in the light of further knowledge. Poverty is the twin sister of disease, and in respect of poverty we are passing through the same stages of evolution as have characterised our knowledge of disease. We must still in many cases of poverty content ourselves with investigating and removing or counteracting adverse conditions, and much successful work in the diminution of poverty can be and is being done by attacking the problem in this relatively crude manner. As our analysis of social evils becomes more complete and our knowledge of the individual and family history of each "case of poverty" becomes more complete it will be possible to use means for the removal of poverty and suffering with steadily increasing exactitude.

(c) It is necessary, moreover, to have constantly in mind that sickness itself is among the main causes of sickness. This is true not only for infectious diseases but also for diseases not caused by infection.

This fact has important bearings on the giving of

UNCONDITIONAL DOMESTIC RELIEF to sick persons treated in connection with the present poor law organization. On this point both the Majority and Minority Reports of the Royal Commission on the Poor Laws have spoken out with no uncertain mind.

Thus, the Minority Report speaks of the operations of the Poor Law Medical Service as inevitably taking "on the character of unconditioned relief—that is, relief of the real or fancied painful symptoms—as distinguished from remedial changes of regimen and removal of injurious conditions, upon which any curative treatment or any effective prevention of the

spread or recurrence of disease is nowadays recognised to depend."—(Min. Rep., p. 1,223.)

The Majority Report states:—

We cannot admit that administrators are justified in this attitude of irresponsibility for the effect of the relief given; and we recommend that in future it should be a condition of out-relief that the recipients are leading respectable lives in decent houses . . . the relief authority should proscribe such areas for the purpose of outdoor relief.

—(Maj. Rep., p. 152, par. 268.)

Again the Majority Report states:—

Opinions may differ as to the degrees of strictness desirable in poor law administration; but no possible justification can be advanced for the granting of out-relief in such a way as to perpetuate pauperism and the evil conditions which give rise to pauperism.—(Part IV., par. 261.)

And they forecast, I think very accurately, that:—

A policy such as this (amounting to a proscribing of dirt, and insanitary houses and areas) gradually but steadily pursued until it was generally recognised, would, we are convinced, do much to diminish the evils of dirt, overcrowding, and immorality, not only amongst the actual recipients of relief, but also among their neighbours.—(Part IV., par. 270.)

Here the condition is definitely laid down that relief must be associated with the treatment of sickness under the conditions best adapted to secure the recovery of the patient and the safety of others from infection; and that for this purpose the removal of the evils of dirt, overcrowding, and immorality must be insisted upon. In this line of action we have means of administrative control of sickness and insanitary or immoral conditions which, if judiciously and efficiently worked, open out a vista of vastly extended preventive social medicine.

(d) If to the fact that sickness is one of the main causes of sickness we add the further fact that a large mass of sickness is now neglected, from which in its earlier stages recovery might have occurred, but which at later stages causes protracted or permanent incapacity, it will be evident that one of the chief means of increased social efficiency will be

THE EARLY TREATMENT OF SICKNESS.

The means for securing this are discussed in the Reports of the Royal Commission on the

Poor Laws, and it is evident that we are evolving in the direction of a medical service, in which treatment will be regarded as a part of preventive medicine, the economic justification of any increased cost involved in this being found in the decrease of sickness which must follow, with the corresponding decrease of poverty and inefficiency.

(c) In the interest of frugal and efficient administration it is necessary that the local administrative machinery for the control of poverty and sickness should secure the best result for a given expenditure of money and effort and for a given amount of effort by workers; that there should be no avoidable hiatus or overlapping of effort, but that the most active and complete co-operation of workers should be secured.

Apart from considerations, into which I cannot enter, as to whether our present administrative machinery of the control of poverty and sickness fulfils these requirements, much can be done even under present conditions to increase efficiency of local government.

EFFICIENT UNITS OF ADMINISTRATION.

Take, for instance, the question of efficient units of government, and let me illustrate this from the West Riding of Yorkshire. Consider the statistical and administrative confusion arising from the fact that the City of Leeds, for instance, is comprised within four poor law unions, a portion of each of which is also outside the city boundaries.

But the worst illustrations of anomalies of local areas are to be found in the case of small urban districts, and here they result in administrative inefficiency to a serious extent. Some of the most flagrant examples are to be found in the West Riding, in which inefficient urban sanitary districts have been formed under the powers given to the County Council by the Local Government Act, 1888, which enabled them to carve urban districts out of rural districts within the administrative county, the Local Government Board having no power to prevent the formation of these inefficient districts unless the rural or urban district concerned opposed the proposed action and appealed to the Board. At the same time very little action has been taken by this and other county councils to act on their powers to form more satisfactory units for local government, when the present units were obviously inefficient and extravagant.

Let me give a few facts illustrative of some of the resulting conditions in the West Riding. At

the last census 1,450,059 of its population was aggregated in seven county boroughs, 360,055 in fourteen boroughs having a population varying from 8,230 (Ripon) to 41,564 (Keighley), and 705,850 in 117 urban districts. Of these 117 urban districts one (Shipley) had a population over 20,000, three (Bingley, Castleford and Goole) had a population between 15,000 and 20,000; 19 had a population 10,000-15,000; 30 had a population 5,000-10,000; 44 had a population 2,000-5,000; and 20 had a population under 2,500.

From official statements as to the salaries given to medical officers of health and inspectors of nuisances it is practicable to ascertain the cost of the sanitary services as indicated by the salaries of medical officers of health and of inspectors of nuisances in each of these groups of districts. It is stated in the following table in terms of the population served by £1 of salary given under each head:—

In districts having a population	No. of population served by £1.	
	With Medical Officer of Health.	With Inspector of Nuisances.
Under 2,500	...	...
2,500-5,000	95	58
5,000-10,000	144	110
10,000-15,000	197	97
15,000-20,000	237	127
Over 20,000	218	150
In boroughs	197	213
In county boroughs	191	184
	446*	?

* Some county boroughs have also assistant medical officers of health.

Evidently the expenditure is heaviest in proportion to population in the smallest districts. Were it possible to analyse local expenditure more accurately the disproportionate cost of sanitary administration in the smaller districts would be still more evident; nor is this counterbalanced by increase in sanitary efficiency; for as I have said elsewhere in commenting on Dr. Farrar's report to the Local Government Board on the sanitary administration of some of these small districts in the West Riding, such "local self-government is both extravagant and inefficient. There is an unnecessary multiplication of officers, who cannot be paid sufficiently to devote themselves without distraction to the public interests; on the part of the sanitary authorities of paltry districts like these, local and personal considerations too often outbalance the public interests, and the multiplication of small areas forms a serious obstacle to an efficient and economical settlement of problems of water supply and sewerage in

which neighbouring districts are mutually concerned."*

Consider next the question of

EFFICIENT OFFICERS.

Here again I confine myself to the question of sanitary officers. Efficiency in respect to these officers implies in most instances the need that they shall be confined to the discharge of public duties—not necessarily to one post—and shall not have the disturbing and sometimes incompatible distraction of private practice of any kind. The tenure of office of sanitary officers devoting their whole time to the discharge of their official duties is still most insecure. It is a remarkable and anomalous fact that district medical officers and relieving officers and vaccination officers can only be removed from office with the consent of the Local Government Board, and that the first-named officers are not, as a rule, elected for limited periods or subject to periodical re-election, while the majority of medical officers of health throughout the country are subject to election at intervals of one or at the most of five years. Local sanitary authorities are not averse to these periodical re-elections, but this is not a sufficient reason for continuing an arrangement which in many instances endangers the re-election of efficient officers at the expiration of their limited term of office.

Conditions of appointment which enable more satisfactory sanitary work to be accomplished have already been secured for medical officers of health in London and in a certain number of combined districts. Under the Housing Bill similarly satisfactory tenure will be secured for county medical officers of health. Efficient sanitary administration demands the extension of satisfactory conditions of tenure of office, and the most satisfactory settlement of the problem will come in connection with the establishment of efficient units of local government.

HIATUS AND OVERLAPPING OF WORK.

The gradual growth of local administration as need arose has been accompanied by many anomalies needing attention. Destitution, for instance, whatever its cause, has been relieved by boards of guardians; and so it has come about that when the cause of destitution is infectious disease both boards of guardians and sanitary authorities may be engaged in treating cases, for instance, of erysipelas, puerperal fever,

phthisis, while board of guardians usually hand over the treatment of cases of small-pox and other acute infectious diseases occurring among paupers to the sanitary authorities. Similarly the means of preventing most diseases are controlled by sanitary authorities, of preventing small-pox by the boards of guardians. Again, midwives are supervised outside county boroughs by the county council, while health visitors to babies are usually employed by the local sanitary authority, infant protection visitors by the board of guardians, and school nurses by the education authority, and so on. Some of these arrangements can scarcely be said to conduce to the highest efficiency, though to follow out this line of observation would extend beyond the scope of my present address.

There are many directions in which increased efficiency of official work might almost immediately be secured, given the necessary local sentiment in this direction, and the needed combination of local governing bodies.

The district medical officer possesses a very detailed knowledge of the exact conditions under which the impoverished live. And yet so far as preventive medicine is concerned this valuable means for social betterment, apart from the scantily utilised powers of section 3 of the Public Health (London) Act, 1891, continues to be wasted. In recommending its further utilisation, the recent Poor Law Commission were but re-discovering what was pointed out years ago by Chadwick, Simon and Rumsey.

Thus Chadwick in 1842 said:—

"It would scarcely be practicable to ensure as certain and well-directed an examination of the residences of the labouring classes, as I conceive may be ensured from the medical officers of the unions."

Simon,* in his first annual report on the "Sanitary Condition of the City of London" (1849), said:—

"I may remind you that each of these gentlemen (having medical charge of the three city unions) works within a certain small and definite district; that he is, therefore peculiarly competent to speak on the state of the population in that district, on their habits and necessities, on their customary condition of health, and on their liability to epidemic disease; and that the total staff of these officers, taken collectively, representing the medical practice of

* Annual Report of Medical Officer to Local Government Board for 1907-8, p. viii.

* Simon, "Sanitary Condition of the City of London," page 61.

the whole city, can supply exactly that kind of detailed and precise information which is most serviceable to your officer of health, in guiding him to those more general and comprehensive conclusions which it is his business to lay before you. . . . I am convinced that the expensive and cumbrous proceeding (of obtaining help in sanitary investigation from without) would have a smaller measure of success than that which I submit to you, and which consists essentially in availing ourselves of the local knowledge and daily observations of a staff of officers, already organised and in active occupation for the very purposes in question."

Similarly Rumsey* (1856) said:—

"There are much higher functions of a preventive nature than those of a mere 'public informer' which the district medical officer ought to perform. He should become the sanitary adviser of the poor in their dwellings. Many removable causes of sickness within their own control would be pointed out during his beneficent visits. The miserable effects of alcoholic stimulation might be impressed on the minds of sufferers from intemperance, at times when no warnings or counsels save those of a medical visitor would be listened to.

"The state of the apartments of the poor, their clothing and bedding, the choice and preparation of their food, the physical management of their children, their nursing in sickness,—would all come occasionally under his cognisance. . . . If the precise cause of mischief were beyond his means of detection he would direct the attention of the superior officer of health, or the local administrative body, to the matter."

In the past the combination of the posts of medical officer of health and of district medical officer in one person has commonly not worked well; but there has been, I believe, no attempt to combine in districts of suitable size the duties of the two offices in the hands of a diplomate in public health having satisfactory tenure of office and without the distractions of private medical practice. In scattered districts such a combination would be excellent, and in all large towns the district medical officer could with advantage be similarly engaged in the work of clinical and of preventive medicine, in active relation to the

chief medical officer of health. The present stumbling-block in the way of action in this direction is the common non-coincidence of sanitary and relief areas.

Happily, active co-operation has been arranged between the medical officer of health and the school medical officer, and there are opened up by this means prospects of extended work in preventive medicine, the full importance of which has not hitherto been realised.

Among non-medical workers there is even greater scope for active co-operation, and in scattered districts for economical combination of offices. In such districts the qualified inspector of nuisances may often, for instance, with advantage be also the relieving officer or vaccination officer, or assistant registrar of births and deaths. At present there is commonly in the same district the school attendance officer, who, outside autonomous education areas, is under the county council; the inspector of nuisances, who is under the local sanitary authority; the vaccination officer, who may be also the relieving officer, and who is under the board of guardians; when it might be to the great advantage of the district to substitute one or two whole-time for four or more part-time officers.

Similarly the duties of school attendance officer and of school nurse may occasionally in country districts be combined, for a common cause of absence from school is sickness, and in all cases the school attendance officer and the school nurse are valuable aids to success in the work of school and general hygiene when this is properly organized. With the sanitary inspector and the health visitor they form important links in the chain of public health administration.

The health visitor is becoming increasingly important, as personal hygiene takes its proper place in administrative work. Except in large towns considerable difficulties arise at present in adjusting areas of work. In country districts arrangements may sometimes with advantage be made, as has been done by Dr. Bostock Hill in Warwickshire, for the health visitor to be also school nurse, thus enabling her to concentrate her work within a more manageable area.

Boards of guardians have the power to appoint district nurses for the home nursing of pauper patients in their district. Under the Children Act they also must appoint infant protection visitors. At the same time sanitary authorities are realising more and more the

need for health visitors, and education authorities the need for school nurses, and county councils for midwifery inspectors. The mere statement of these facts suggests economical and efficient combination of functions, if only these different authorities would divest themselves of mutual jealousies and remember that, apart from embarrassing differences of units of administrative area, they are dealing with the same public funds, and morally bound to use them with frugality and efficiency.

In large towns overlapping of work is perhaps less marked, and greater specialisation is inevitable; but the arrangements for co-operation between the different officers need to be developed and extended.

In the endeavour for efficiency the discovery and application of the most efficient means for combining

VOLUNTARY AND OFFICIAL EFFORT

must bear a large part. Those who fear the extended rule of bureaucracy do not sufficiently realise that in British self-government, whether central or local, the elected amateur always has the controlling power, whether as Member of Parliament or as a member of local governing bodies. This British method, though occasionally irritating to the expert, is in my view a satisfactory compromise. Out of the often tedious conflict of public discussions comes real progress, which although it may not be so great as the expert officer would desire, is less likely to be out of perspective with other branches of work than the expert's original proposals. The doctor who orders chicken broth for the patient with 20s. a week wages is occasionally paralleled by the medical officer of health who recommends an expensive sewerage scheme when simpler methods would suffice; or by the case of the medical officer of health who fails to look at sanitary problems in their social setting, or who urges an isolation hospital without pressing upon his committee the importance of also searching out unnotified "missed" cases; or of the school medical officer who may be inclined to urge school meals apart from attempts to remedy the conditions of the family to which the underfed child belongs.

The non-expert has the controlling voice over the work of local and central authorities in virtue of his representative character. He is sent by the public to exercise this control, and particularly by two interested sections of the public. Owing to the indifference of the

majority of ratepayers, the choice of representatives lies commonly in a large measure with earnest social workers, and with those who wittingly or unwittingly lend their influence to would-be representatives having their own interests in view. Thus the efficiency of local administration depends largely on the intelligent devotion of voluntary workers and on the possibility of rousing the inert general public into conscientious activity.

Were I to attempt to lay down the correct sphere of voluntary and official effort, a separate address would be needed. The most efficient official work, doubtless, is that which can secure the maximum amount of voluntary assistance, filling up the blanks which official action necessarily leaves, stimulating and encouraging official workers, and fostering a wider interest in movements for social progress than official efforts can secure.

No official workers, certainly no medical officer of health, can be said to be obtaining the best possible results for the sanitary and social improvement of the district in his charge unless he takes stock of all collateral official and non-official efforts having the same ends in view, and unless he has strained every nerve to secure complete co-ordination, to avoid overlapping and hiatus of effort, and to obtain the regular exchange of information, so as to secure the greatest good for a given expenditure of energy.

But without endeavouring to illustrate these remarks in the sphere of religious social organisations, of charitable societies, of voluntary hospitals and dispensaries, of friendly and other allied societies, I must hasten to a conclusion. Let me, however, make a few remarks on the

EFFICIENCY OF THE ONLOOKER.

Some here may think that they avoid the need for strenuous effort after efficiency by not taking part in official or voluntary administrative work. They may have sufficiently good reasons for this abstinence; and onlookers have their rôle in life. If we were all authors, where would be the readers? There are many indifferent writers who would be appreciative readers, and the same remark applies in local administration. Appreciation is necessary as well as a subject to be appreciated; and the onlooker at social work may be most helpful. If he is to be helpful he must be kindly and charitable. Rancorous and ill-informed criticism must be avoided, and the onlooker must be ready to do justice to good work, or attempted

*Rumsey, "Essays in State Medicine."

good work. Nothing has made it so difficult to secure good men to undertake the burden of local government as the indiscriminating and uncharitable criticism aimed at those engaged in it. Criticism of representatives has often been deserved; but critics are too often those who will not aid to the slightest extent in the work which, often without sufficient knowledge of the facts, they villify. When we read of poor law or municipal scandals, it is desirable to have a sense of proportion, and to remember, as the reader of old records or even of Pepys' diary will scarcely need to be reminded, that corruption was rampant in the past, and especially to remember that the best way to remove corruption is by ourselves taking a part in local government, or by steadily upholding those who are doing so with integrity.

The onlooker, then, has his duty to perform as well as the administrator. He cannot do his duty unless he intelligently studies local administration, even though he takes no part in it. A chief need is this interested study of the phases of local administration by the general inhabitants of each district. Happily there are indications of the increasing local patriotism which such study implies. The exact knowledge thus acquired is the best means of neutralising much of the ill-natured, because ill-informed, criticism with which the founts of local administration are too often fouled. A high moral ideal on the part of onlookers as well as of administrators is needed if we are to secure that high standard of social efficiency which is an indispensable condition of the further triumphs of preventive medicine, in the highest sense of the word, now ready to be secured.

MUNICIPAL BABY-WEIGHING.—A portable spring balance has been provided for weighing babies, and its habitual use has greatly stimulated the interest of mothers in the healthy development of their infants. The prejudice which originally existed against the weighing of infants has largely disappeared, and the result of each successive weighing is awaited with interest. A healthy rivalry between mothers to show the best developed child has been promoted. One important fact has been made clear, namely, that the great majority of the children are well developed and healthy at birth, and when properly cared for subsequently, maintain the standard. The physical deterioration met with during the first year of life is almost wholly due to ignorance and carelessness.—*Annual Report of Dr. John Knight, Medical Officer of Health, Scarborough.*

ENTERIC FEVER IN IPSWICH.

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THE history of enteric fever in Ipswich is of profound interest, since it enables one to study the behaviour of the disease under two precisely different conditions, viz., (1) in a town served practically entirely by a privy midden system, and (2) in a town converted practically entirely from the privy midden system to the water carriage system.

The subject, however, cannot be considered from the point of view of filth conditions alone, since recent investigations have shown that a considerable number of cases of enteric fever can be traced directly to the effects of infection derived from cockles taken from the sewage-polluted zone of the River Orwell.

In the first instance the subject will be considered without reference to cockle cases since these were not recognised until 1902, although there is no reason to doubt that they had been a disturbing factor for many years prior to that date.

Prior to 1894, Ipswich was practically entirely a privy midden town. In that year the Public Health Committee began to take steps to secure the abolition of middens, replacing them by the water carriage system.

The following table exhibits the number of privy middens in existence at the beginning of each year since 1894, and the number of privy middens abolished in each year since that date:—

Year.	Number of Middens in existence at the beginning of the year.	Number of Middens abolished during the year.	Number of Middens remaining.
1894	8,045	252	7,802
1895	7,802	296	7,506
1896	7,506	554	6,952
1897	6,952	570	6,382
1898	6,382	567	5,815
1899	5,815	802	5,013
1900	5,013	999	4,014
1901	4,014	1,157	2,857
1902	2,857	753	2,104
1903	2,104	768	1,336
1904	1,336	608	728
1905	728	499	229
1906	229	79	150
1907	150	10	140
1908	140	30	110

Of the remaining middens 63 are situated in the outlying districts of the borough, so that the town proper may be said to be practically free from privy middens. Ipswich has thus been converted from a practically entirely

midden town to a practically entirely water carriage town.

In dealing with the prevalence of enteric fever in the borough, reference will be made to the figures from the year 1890 onwards, since accurate data are available from that year only. Reference to the annual reports of the Medical Officer of Health prior to that date show, however, that enteric fever had been continually in evidence for many years, and constant attention is drawn to the association of cases of enteric fever with filthy privy middens.

The following table shows the numbers of privy middens in existence in the borough at the end of each year, the number of cases of enteric fever notified during each year, and the attack-rate per 1,000 living during each year since 1890:—

Year.	Number of Middens.	Number of cases of Enteric Fever notified.	Attack-rate per 1,000 living.
1890	8,000 and over...	35	0.60
1891	8,000 and over...	77	1.34
1892	8,000 and over...	45	0.77
1893	8,000 and over...	134	2.27
1894	7,802	41	0.68
1895	7,506	86	1.41
1896	6,952	57	0.92
1897	6,382	55	0.87
1898	5,815	67	1.05
1899	5,013	284	4.38
1900	4,014	92	1.40
1901	2,857	62	0.93
1902	2,104	173	2.55
1903	1,336	45	0.65
1904	728	50	0.71
1905	229	50	0.70
1906	150	36	0.50
1907	140	33	0.46
1908	110	15	0.20

The accompanying Charts I. and II. graphically illustrate the figures given in this table.

Chart I. shows the enteric fever prevalence as evidenced by the number of notified cases of the disease as compared with the number of privy middens in existence in the borough.

Chart II. shows the degree of prevalence of enteric fever in terms of the attack-rate per 1,000 living, as compared with the number of privy middens in existence in the borough.

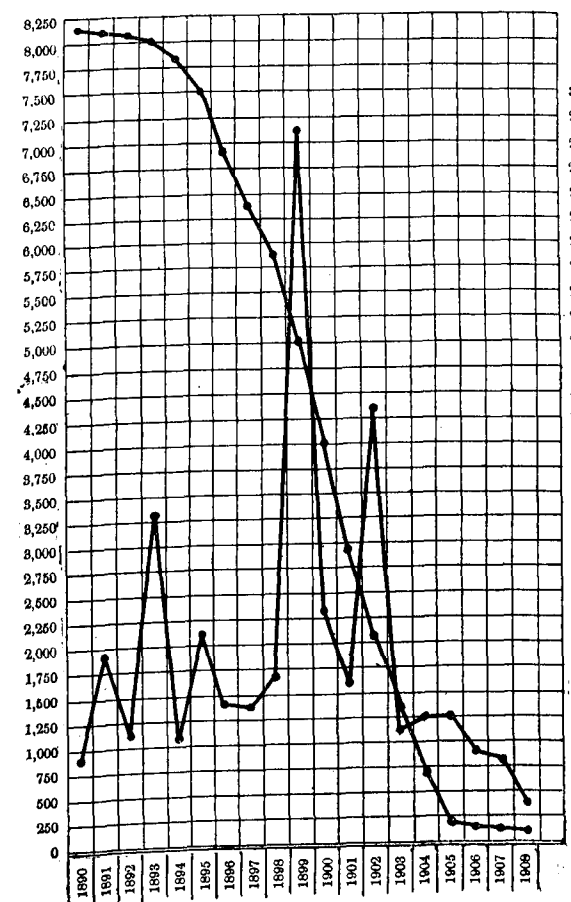
With the aid of Chart II. it is possible to divide the enteric fever history of the borough into two divisions, basing the division on the relation of the attack-rate per 1,000 living, to unity. The two divisions are (1) from 1890-1892 inclusive, and (2) from 1893-1908 inclusive. In the first division the attack-rate was above unity on seven occasions, and below on six. In the second division the attack-rate was below

unity on all occasions. The lowest attack-rate in the first division was 0.60 in 1890. In the second division the attack-rate of each of the last three years was below this figure.

CHART I.

The figures on the left hand refer to the numbers of privy middens in existence in the town during each year.

The figures on the right hand refer to the numbers of cases of enteric fever notified during each year.

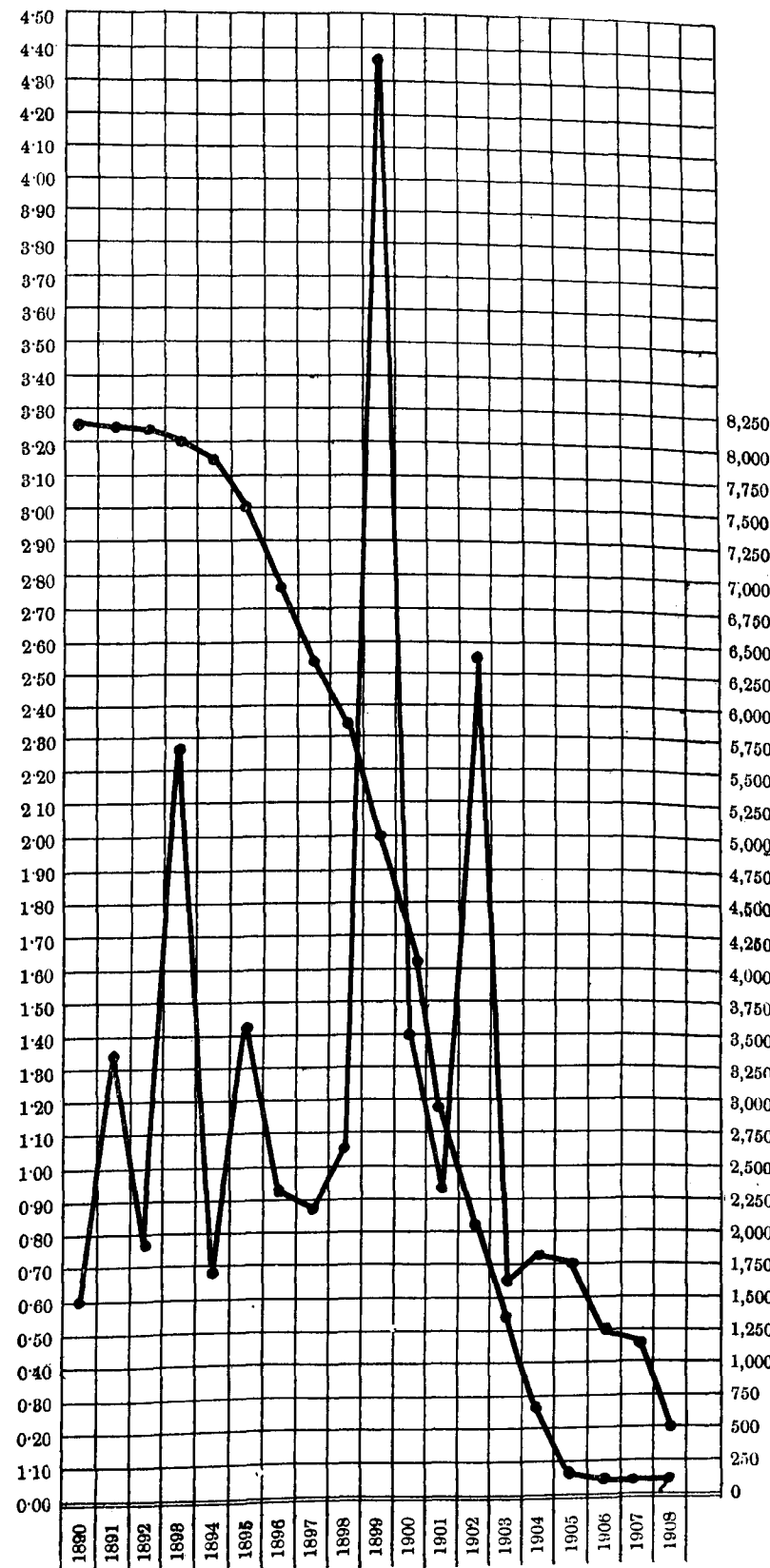


It is therefore abundantly clear that there has been a marked diminution in the degree of prevalence of enteric fever in the borough of recent years. It is further evident that this diminution coincides in a remarkable manner with the diminution in the number of privy middens in the borough. In the first division the number of privy middens varied from over 8,000 to 2,104. During the last four years of the second period the number of privy middens was below 250. During three of these last four years the enteric fever attack-rate fell to a point lower than any recorded since notification was adopted.

A point of supreme importance in this relation is the alteration in the type of the curve in the first division as compared with the

CHART II.

The figures on the left hand represent the attack-rates per 1,000 living. The figures on the right indicate the numbers of privy middens in existence.



second. The first division shows marked evidence of great instability, there having been at least three epidemics of considerable severity during the thirteen years comprised in the curve. On the other hand, the predominant feature of the curve in the second division is the absence of any evidence whatever of a tendency to epidemic prevalence, the curve tending rather in the direction of progressive diminution.

This feature of instability is well illustrated in the following table, which shows the monthly notifications of enteric fever since 1898. The monthly figures for the years prior to that date are unfortunately not available.

TABLE SHOWING THE MONTHLY NOTIFICATIONS OF ENTERIC FEVER IN IPSWICH SINCE 1898.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Whole Year.
1898.	2	—	2	—	2	—	3	6	11	19	15	7	6
1899.	7	4	2	9	3	6	14	27	88	87	24	13	28
1900.	5	5	4	1	5	1	6	12	17	14	14	8	9
1901.	1	3	2	—	—	—	—	5	7	5	11	19	2
1902.	3	5	4	4	7	17	39	25	37	16	14	2	17
1903.	2	4	1	2	2	4	2	4	6	5	2	1	4
1904.	3	5	3	5	4	5	2	5	9	5	2	1	5
1905.	—	—	1	3	9	3	5	19	3	4	2	1	3
1906.	—	—	—	2	3	3	1	4	7	11	4	2	3
1907.	1	1	1	1	2	3	6	3	5	—	4	2	1
1908.	—	—	—	1	2	2	5	3	2	—	—	—	—
Totals	24	28	20	28	39	47	88	115	190	173	107	48	90
Quarterly Totals	72			114			393			328			

It is at once evident from this table that 1898 showed the ordinary character of endemic enteric fever, viz., constant presence, with increased prevalence during the latter part of the year, particularly September, October and November. In 1899, the year of the worst recorded epidemic, autumnal prevalence is very marked. It appears to me as if this were merely an extreme fluctuation of the normal autumnal rise.

In 1900 the same tendency to autumnal prevalence is evident. In 1901 it is also evident, though in a minor degree. In 1902 the epidemic began sooner than usual, but still the disease was very prevalent during the autumn months.

From 1903 onwards a remarkable change is evident. With the exception of two small rises, viz., in August, 1905, and October, 1906, there is no evidence of any tendency to anything approaching to epidemic prevalence. It

other words, though enteric fever was still endemic, it had ceased to be epidemic. From 1903-1906 inclusive enteric fever was more prevalent during the autumn months than at any other portion of the year, but in no year was the fluctuation so great as to approach epidemicity. What the rise really represented was a miniature reproduction of the normal autumnal increase.

A feature of great interest in this table is the alteration in the number of notifications during the first quarter of the year. From 1898-1904 inclusive, sixty-seven cases of enteric fever were notified during the first quarter, as compared with five from 1905-1908 inclusive. If this fact be viewed along with the tendency to disappearance of epidemicity, it may legitimately be taken as evidence of a tendency to the initiation of the discontinuance of endemicity.

The figures for 1907 and 1908 afford no evidence of the usual autumnal variation.

The information derived from the preceding investigation may be summarised as follows:—

1. The greatest degree of prevalence of enteric fever in the town coincided with the time during which the number of middens exceeded 2,000.

2. The degree of prevalence of enteric fever markedly diminished when the middens were practically abolished.

3. The history of the disease during the midden era was marked by considerable epidemic fluctuations.

4. With the disappearance of the middens the tendency to epidemic fluctuations appears also to have disappeared. At any rate, there has been no epidemic during the last six years, a feature which is quite at variance with the previous character of the disease in the town.

5. During the midden era each year showed a marked autumnal rise.

6. The autumnal variation has been almost absent during the last six years.

7. During the midden era the endemic character of the disease was well marked.

8. Of recent years there has appeared a tendency to total disappearance of the disease for relatively long periods.

9. Finally, the period of least degree of prevalence of enteric fever absolutely coincides with the period of abolition of the middens.

In the light of the evidence thus adduced, and in consideration of the facts that the bacilli of enteric fever are found in enormous numbers in the urine and faeces of patients

suffering from the disease, and have been conclusively shown to be capable of existence for considerable periods outside the human body, and that the conditions suitable for extra corporeal life on the part of the bacilli are precisely those which obtain in the case of the midden, I have no hesitation in ascribing the present low degree of prevalence of the disease to the disappearance of the privy midden.

It has been stated previously that the existence of enteric fever in Ipswich is not a simple matter of fifth conditions. A considerable number of cases of recent years have been traced directly to the consumption of cockles taken from the sewage-polluted zone of the river Orwell.

I do not propose to discuss this matter fully at the present time, but will simply state the following facts:—

1. It has been proved that the Orwell cockles are polluted with sewage.

2. The bacillus of enteric fever has been isolated from the cockles.

3. The relationship between cockles and cases has been as conclusively proved as it is possible to expect under the circumstances.

The first cockle cases were recognised in 1902. There can be no doubt that cockles were responsible for enteric long prior to this date, but there is no evidence available on this point. It is, however, safe to assume that the proportion of cockle cases prior to 1902 bears a fairly definite ratio to the proportion discovered since that date.

The following table will illustrate the degree of influence of the Orwell cockles:—

Year.	Number of cases notified.	Number due to cockles.	Percentage of cockle cases.	Number with no cockle history.
1902	173	35	20.2	138
1903	45	5	11.1	40
1904	50	2	4.0	48
1905	50	9	18.0	41
1906	36	7	19.4	29
1907	33	9	27.2	24
1908	15	7	46.6	8

The cockle cases thus assume a rather large proportion, especially during the last two years. This, however, merely represents the fact that as the number of cases due to other conditions diminishes, that due to cockles becomes proportionally greater.

This table casts an interesting side-light on the 1902 epidemic (the last epidemic recorded). It is evident that cockles played no inconsiderable part in the production of this

epidemic. It is possible to assume that cockles played a really greater part than would appear at first sight, since the cockle cases may have been, and no doubt were, the source of secondary cases of the disease which would not be included as cockle cases. In this relation it may be pointed out that the class of patient who suffers from cockle enteric is usually the poorest, since this food is consumed by the very poorest section of the community. These were precisely the people who inhabited houses provided with the worst type of midden. Thus, as long as these middens continued to exist, and so long as the Orwell cockles continued to be consumed, opportunities for specific pollution of the middens continued to exist. There can therefore be no doubt that this influence was a prime factor in the maintenance of endemic enteric fever.

This appears to me to be but another proof of the injurious influence of the privy midden, since, in spite of the fact that cockle cases continue to occur, the amount of enteric fever has fallen, and fallen markedly, since the privies have practically disappeared.

The history of the cockle cases during the last three years has shown that they tend to occur in groups and that these groups are most common during June and July. Therefore, they are independent of the ordinary autumnal rise, though probably in former years they were a contributory exciting cause. During the last three years they appear to have exerted no influence in this relation.

Again, during the last three years the cockle cases were not the known source of any other cases of the disease. The explanation of this fact I believe to lie in the fact that opportunities of soil pollution in the immediate vicinity of the homes of the people no longer exist.

DEATH REGISTRATION.—It is not creditable to the State, as the guardian and conservator of the prospective interests of the race, to lose a single subject without being furnished with a certificate of the cause of death, properly attested. The law now allows a registrar, almost always a layman, to accept a certificate from an unqualified person, provided that he, the registrar, is persuaded that deception is not being practised. The proper course is, without doubt, to hold an inquiry in every such case, and, where needful, a post-mortem examination. These steps will probably be taken only when the registration of the cause of death is placed under the control of the sanitary authority.—*Annual Report of Dr. H. Cooper Pattin, Medical Officer of Health, Norwich.*

DENTAL SURGERY IN RELATION TO THE PUBLIC HEALTH SERVICE.*

By F. LAWSON DODD, L.R.C.P., M.R.C.S.,
D.P.H., L.D.S. Eng.

IT is a duty of all professions to examine at frequent intervals their relationship to the social structure of which they form a part, and to adapt themselves to those new conditions continually created by social development and the progress of science. This is especially true in regard to dental surgery, which, though a comparatively modern science, has now taken its place among the necessities of civilised life, and has gone forward with such rapid strides that the dentist of twenty-five years ago would be no less amazed at the outfit of the average modern practitioner than at the discovery of the close relation of dental conditions to general pathology or of the part played by bacteria in the production of oral diseases. He would see, moreover, the beginning of the necessary result of all this growth in a changed public opinion in regard to dentistry. The members of the dental profession have been missionaries arousing a sense of the importance of oral cleanliness and the possibilities of dental treatment in the minds of the general public. The importance of our professional work has not been diminished by the discoveries of science. "Toothache," formerly supposed to be the only condition in which our dread treatment could be of use, is now falling into a second place, as we become aware of the effects of dental caries in the production of oral sepsis, secondary anæmias, alveolar abscesses, glandular and tonsillar conditions, digestive disturbances, tubercular and other infections, gastric ulcers, peripheral nervous irritations producing epileptic conditions, and such habits as mouth breathing and food bolting. We are, in fact, to-day witnessing the gradual recognition of dentistry as a branch of preventive medicine—preventive, moreover, against diseases whose seriousness becomes more apparent with every advance in scientific investigation.†

It is well here to point out that the science of public health, itself a comparatively modern development, has undergone a considerable modification during the last decade. Formerly occupied with the environment of the people

* A paper read before the Annual General Meeting of the British Dental Association, June 1st, 1909.

† Report of the School Dentists' Society for the year 1907. Reprint of the Seven Reports of the Committee appointed by the Representative Board of the British Dental Association to conduct the Collective Investigation as to the Condition of the Teeth of School Children. 1891.

as a whole, with the improvement of dwellings, the removal of refuse, the purification of water supplies, the abolition of food adulteration, etc., it has in recent years been paying attention to individual needs, such as the inspection of school children, the care of infants and nursing mothers, the spread of information in regard to the dangers of spitting, the use of alcohol, and tobacco. Health visitors go to the homes of the people, and milk is supplied to young children. All this indicates the tendency to build up what may be called a science of preventive treatment, and it is not unnatural that it should centre mainly round the elementary school.

This movement has been accompanied by, or, more exactly, has been the result of, a growing sense of public responsibility in regard to the physical welfare of the race, and an increasing desire to know whether national physical deterioration is in fact setting in. Two public enquiries were set on foot after the Boer war,* and both resultant reports draw attention to the widespread physical unfitness of individuals, to the large amount of disease of a preventible kind, and to the need for legislative action in combating it. It is outside the scope of this paper to do more than refer to the general diseases reported by the Commissioners. We must, however, note what they say in regard to the condition of the teeth of those examined for them. For instance, Dr. Leslie Mackenzie,† reporting on the condition of the teeth of the 600 Edinburgh children examined by him, says: "More than a fourth of the children were recorded as having unclean teeth. Only some 5 per cent. used a toothbrush daily. Some 7 per cent. showed delayed development of the teeth. . . . In 571 cases out of 591 examined we found some decayed teeth of the first set. The average number of first set teeth so found was 4.95. In 110 cases the second showed decayed teeth, the average number of such teeth being 2.51. A considerable number showed defective teeth of both sets." Professor Hay, reporting on 600 children from Aberdeen elementary school, says in a report to the same Royal Commission: "Decay of the permanent teeth was present in fully one-third of the children of the lowest age groups (6 to 9 years) and had apparently begun in most of these almost with the first appearance of the permanent teeth."

* The Royal Commission in Physical Training (Scotland) (Cd. 1507), 1903.

† The Interdepartmental Committee on Physical Deterioration.

The last year (8 to 9) of this age group witnessed a larger addition to the children with decayed teeth than any subsequent age. By the age of 10 or 11 the proportion of children with decayed teeth had risen to nearly four-fifths, but it did not show a material increase at the later ages. The proneness of teeth to decay was, therefore, of early origin. Decay of the permanent teeth was usually associated with decay of the first set. Probably the early removal of decayed teeth among the first set would assist greatly in preventing decay of the second set. The average number of decaying teeth per child was a little over two in the first age group and increased to three and a half in the highest age group. The Physical Deterioration Committee,* reporting in 1904, say: "There is no doubt that the teeth of the people have become much worse of late years, and in many parts of the country may now be described as very bad." The evidence on which this opinion was founded consisted of reports from two committees of the British Dental Association,† and on the results of an Interdepartmental Conference of the Admiralty and War Office, the Sub-Committee of the London County Council,‡ which recently reported on the question of medical treatment of the children in elementary schools, bears out the universal testimony as to the serious condition of the teeth of the bulk of the population.

The condition we have to face, then, is that about 86 per cent. of the poorer classes—who themselves constitute about seven-tenths of the population—are suffering from dental disease to a greater or less degree. Though in this generation it may not be preventible, yet it is clear that by simple treatment at least all the more serious results may be avoided, and a great step taken towards improving the health and physique of the nation. It is also clear that the nation has made up its mind on this point, and is already preparing for a general physical inspection of the whole elementary school population,§ so that in a few years evidence on a wide scale will be available and will doubtless bear out the result of the piecemeal investigations that have up to the present provided our only sources of information. It follows that the building up of a system of treatment of disease among elementary

* Report and Appendix, Interdepartmental Committee on Physical Deterioration, 1904 (Cd. 2,175).

† Ibid, Appendix XXVIII.

‡ Report of Medical Officer (Education) to the L.C.C., 1908-9.

§ Vide Education (Administrative Provisions) Act, 1907.

school children, probably on the lines laid down in the Memorandum of the Board of Education,* is on the horizon, its arrival merely a matter of time. This system will include the treatment of dental disease, and it is obvious that in the new specialism which is being built up to meet the situation, amongst the various departments of school hygiene (all of which will be co-ordinated under the sanitary authorities and their medical officers of health) the work of the dentist is bound to take a foremost place.

The growing sense of responsibility on the part of the nation in regard to the health of the elementary school child has not been without sympathy and support from within the ranks of the dental profession, but the work of such bodies as the School Dentists' Society,† must be considerably enlarged, and the education of the public in regard to the great need for treatment among the poor must be carried on by dental surgeons with greatly increased vigour if we are to clear ourselves of the charge that we are neglecting our proper function except where payment binds us down to its performance. For it is education and public service that is demanded rather than charity. And there is no denying that the task of providing simple dental treatment to those who need it—even though we confine our efforts to children under sixteen years of age—is enormous. Edinburgh, for instance, will provide 24,000 patients at once, though we count only 80 per cent. of its school population as needing treatment. Aberdeen will provide 20,000 patients needing attention every six months. London‡ will present about 720,000 patients to be treated. England and Wales give a school population of 6,000,000, which will provide on the lowest computation 4,800,000 patients. How is this work to be done?

There are at present on the Dental Register 5,000 practitioners, most of whose time is fully taken up in attending to the needs of the more fortunate classes. The dentists of Edinburgh, for instance, can hardly be expected to provide treatment for 24,000 extra patients in the elementary schools. Aberdeen can hardly place a burden of 20,000 sets of carious teeth upon her already well occupied small band of sixteen registered dentists. Two facts are

* "The Memorandum of Medical Inspection of School Children, etc.," Board of Education Circular, 567, 1907.

† Annual Report School Dentists' Society, 1908. W. Fisk, Watford, Hon. Secretary.

‡ "Statistical Abstract for London," 1908.

§ This computation is based on the assumption that the proportional increase in this country is the same as that for England and Wales.

clear: one is that the work to be done is enormous in amount; the second is that the necessary qualified workers do not exist. The harvest truly is plenteous, but the labourers are few.

It is well known to all of us that there exist two services of dentistry in this country. One is registered and the other unregistered. The registered may be divided into a main body of qualified and a small minority of unqualified. The unregistered are again divisible into the qualified, who are a small minority, mostly Americans, and a large majority of unqualified. In the main this secondary dental service has sprung up in answer to a demand—the demand of a large public who are too poor or for some other reason unwilling to pay the fees demanded by the qualified man. With the exception of a few highly skilled men who usually demand large fees, the work of the unregistered service of dentistry consists mainly in extracting teeth and putting in artificial dentures, and this in no way meets the need of the moment as presented by the treatment of school children; it hardly touches the dental necessities of the poorer classes for whom the nation is about to provide. What, then, should be the policy of the profession in regard to this work of preventive dentistry?

It seems clear that our first aim should be the extension and multiplication of facilities for the care of the teeth to the mass of the population, and especially to the elementary school children. Not until a dental clinic is established in connection with every centre of elementary education will the dentist be doing his share in the maintenance of the welfare of the race. This movement is showing itself in concrete examples in such institutions as the Cambridge clinic in our own country; and in Germany, where for many years the school dentist has been a feature of the educational machine, much has been done. In 1905, for instance, Dr. Jessen, of Strasburg,* in face of opposition obtained permission to examine the teeth of 10,000 school children, with the result that only 4.5 per cent. were found to have healthy dentition, and a systematic treatment was instituted. At Mulhausen similar work is being done, and also at Darmstadt, where the municipality provides and supports the entire institution.

There is thus a new and wide field for activity opening before our profession, and

* "The Care of the Teeth in Public Elementary Schools," by C. E. Wallis. J. & A. Churchill, 1908.

offering satisfactory and, we hope, well-paid work to large numbers of the practitioners of the future, and it is the business of the British Dental Association to see that these are all fully qualified and registered men.

It might appear at first sight that such a course as the establishment of a state service of dentistry in connection with the public health department of the local sanitary authority would be detrimental to the interests of the profession as a whole. It is not difficult, however, to show that it would have quite the opposite effect. In the first place it would provide for a class who at present never seek our services, or, when they do, get their attendance at a hospital in the name of charity, and at the expense of the dentist. This system of *laissez-faire* has meant that the bulk of dental ailments have remained untreated, and the most fruitful source of discomfort, pain, and disease, with its corollary of absences from school, has been allowed full and almost unimpeded sway, growing worse as from year to year the infection has spread from tooth to tooth. Secondly, we should build up a branch of the profession available to those who dislike the commercialism of private practice, or are specially interested in investigation, or from any other reason prefer the public service. Thirdly, such a course, if adopted, would educate the public in the need for and importance of skilled dentistry. Its results in the improved physical and mental condition of the children are well illustrated by the observations of Dr. Jessen, the founder of the School of Dentistry at Strasburg: (1) "That the greater the amount of dental disease the worse the physical development of the child, and (2) that the worse the condition of the child's teeth the worse were its school reports." Lastly, we should be creating a demand on the part of the working classes for skilled treatment in the future and for a service which would be characterized by cleanliness of method and careful manipulation, and impressing upon them from the earliest years the need for oral hygiene.

In this way, it seems probable, shall we establish a national minimum of dental treatment and care. Far from militating against the demand for the most skilful and modern methods of conservative dentistry, the system here outlined would tend to strengthen the position of the best type of qualified practitioners. The national minimum of dentistry would be the natural corollary of a service of a

more luxurious type, and both would inevitably strengthen each other. It is in the best interest of science as well as of the public weal that the provision of dental treatment for the poor should not be allowed to fall into the hands of the unskilful and uneducated practitioner, and in the right solution of this matter we shall have indicated the lines upon which the political problems which are at present so disturbing the profession may satisfactorily be solved.

It will be well for a few moments to consider the problem of the unqualified and unregistered practitioner as affected by the proposals laid down in this paper. It has been forced upon the attention of all observers that the number and power of unqualified and unregistered dental practitioners has greatly increased in recent years. Competition is being felt more keenly every month in certain localities. It is a competition for the practice afforded by that small class who are able to indulge in dental operations. So far as can be judged by reading the debates on the Dental Practitioners Act of 1858, its aim was, to quote the words of its introducer, Sir John Lubbock, now Lord Avebury, in common with the Medical Act of 1858: "To protect the public against quacks by giving them an opportunity of ascertaining whether dentists were properly qualified." It has never been a part of public policy to prohibit unqualified dental or medical practice, and the protection of the public has been the main object of the special distinction conferred upon the qualified practitioner by the Register of the General Medical Council. In the opinion of the writer it is not likely that restrictive legislation forbidding practice of dentistry will, within any reasonable time, be placed upon the Statute Book, and unless some *positive policy* can be formulated the profession will have to subsist on the somewhat meagre fare provided by the occasional and sporadic punishment of unqualified men who overstep, in one way or another, the bounds of the Dentists Act. But is there no better way no more satisfactory policy for us to pursue? It is clear that there is. The merely negative method of suppression of practice, however crude and unsatisfactory, is in itself an impossible line of action to adopt, at least in a community where the vast majority of the population cannot possibly get the attention of a dentist for the very real reason of their poverty, and where the total of all practitioners,

* "Hansard's Parliamentary Debates," vol. 237, p. 1,990.

qualified and unqualified, registered and un-registered, Greek and barbarian, could not perform the task of the dentistry required, even if all were called in to attack it. Every year an increasing proportion of the population is demanding the services of a dentist. In the year 1905 the total number of registered dentists in the United Kingdom was 4,734; this year (1909) the number stands at 5,000, *i.e.*, about 1 to every 8,000 inhabitants. Any profession or political group that comes forward with a merely negative and restrictive policy is bound to meet with little support from the public at large. In the analogous case of general medicine with nearly 32,000 doctors on the register in practice in the United Kingdom no prohibition of unqualified practice has yet been obtained from Parliament, even though the risks arising therefrom are certainly more serious than the same dangers resulting from unskilful dentistry. By extending the scope of the dentist's work to the children of the elementary schools we are opening up a new field for professional practice and at the same time providing an opportunity for newcomers and supplying the needs of the nation; we are helping to build up the physical vigour of the great race to which we belong, and doing something to put our profession on a firm and honest foundation. Furthermore, we are bringing ourselves into line with those economic tendencies which make for the replacing of legislative interference from without by a system of the provision of national needs through the agency of the community itself.

FACIAL ERUPTIONS IN DIPHTHERIA CARRIERS.—Attention has been drawn to the presence of facial eruptions of herpetic or impetiginous nature in diphtheria contacts. Twice the Klebs-Löffler bacillus has been found in such conditions. In one case a boy of five at Hawley Crescent School was found with sores upon his face. The scab of one of these sores was lifted and a culture taken from the resulting raw surface. The growth gave vigorous colonies of Klebs-Löffler bacilli, which were submitted to virulence tests at the Lister Institute by Dr. Arkwright, who found that they were fully virulent. In another case at Elizabeth Street a culture of diphtheria bacilli was obtained from what appeared to be a single patch of impetigo upon the cheek of a school girl. In both instances there were found diphtheria bacilli also in the nasal discharges and in the throats.—*Annual Report of Dr. James Kerr, Medical Officer (Education), London County Council.*

THE TRAINED MIDWIFE; HER EFFECT UPON INFANTILE MORTALITY.

By ALFRED ROBINSON, M.D., D.P.H.,
Medical Officer of Health, Rotherham.

LAST year I prepared a report under the above title, and the paper was published in the March number of PUBLIC HEALTH. The figures then submitted were so unexpected that in consequence I received several communications from various medical officers of health throughout the country, which were written in rather a sceptical spirit.

The same scheme has now been in operation in the Borough of Rotherham for another year, and this report includes the whole of the twelve months in 1908. The same inducements have been held out to the sixteen certificated midwives practising within the borough, and prizes varying in value have been offered to the three midwives who at the expiration of the twelve months ending December 31st, 1908, had the largest proportion of mothers living and the lowest death rate amongst their infants at the end of this period.

The figures for the year 1908 cover the complete twelve months, in place of eleven months dealt with in the year 1907.

There may possibly have been some sources of error in the figures submitted for 1907, but none of my numerous correspondents have been able to detect any.

The figures for the year 1908 cannot possibly contain any fallacies owing to the adoption in Rotherham of the Notification of Births Act. For the sake of comparison the following tables give the results arrived at for the years 1907 and 1908:—

Total number of births during 1907	1,833
Number of births notified by twenty-one certified midwives	923
Number of deaths amongst midwives' cases	94
Infantile mortality rate amongst midwives' cases	101 per 1,000 births.
Number of births attended by other agencies	910
Number of deaths attended by other agencies	177
Infantile mortality rate by other agencies	194 per 1,000 births.
Total infantile mortality rate for 1907	147
England and Wales infantile mortality rate	118
Seventy-six large towns, including Rotherham	177
Annual average mortality rate for last ten years in Rotherham	160

TABLE 2.—1908.

Total number of births during 1908	2,093
Number of births notified by the sixteen certified midwives	939
Number of deaths amongst midwives' cases	87
Infantile mortality rate amongst midwives' cases	92 per 1,000 births.
Number of births attended by other agencies	1,154
Number of deaths of infants attended by other agencies	225
Infantile mortality rate for other agencies	195 per 1,000 births.
Total infantile mortality rate for 1908 (Rotherham)	149
England and Wales infantile mortality rate	121
Seventy-six large towns, including Rotherham	128
Annual average mortality rate for last ten years in Rotherham	159

The "other agencies" include nine uncertificated women practising within the borough, five of whom were *bonâ fide* midwives but were struck off the roll and had their certificates cancelled by the Central Midwives Board. This class also includes "handy women," and the various medical men practising within the borough.

None of these cases have been visited by any of the officials connected with the Public Health Department of Rotherham, medical men naturally resenting any interference with the management or treatment of their patients.

A few births attended by these unqualified women have been notified, but the majority of them have only been discovered when visiting the houses for other causes.

A large number of births have not been notified in accordance with the Act; these have all occurred in a particular portion of the borough, and the highest infantile mortality rate has been amongst these.

In my report last year I stated that I had no hesitation that these figures could be materially improved in future years if proper supervision and encouragement were given to these certified midwives.

During the year 1908 a Voluntary Health Association was formed in Rotherham, consisting of a lady superintendent for each of the nine wards in the borough, with two or three lady helpers, according to the number of births in each ward.

Nearly 1,000 births were notified to these ladies, a list being sent each Monday morning after the midwife has finished her attendance.

These ladies must have paid 3,000 to 4,000 visits during the year, and, as I have already stated, practically only visited births reported

by *bonâ fide* midwives, as the births reported by medical men and "other agencies" have been ignored.

I can come to no other conclusion than that it is due to their untiring efforts that the infantile mortality rate amongst these specially looked after infants have been even more startling than they were for the year 1907.

The mere fact of some of these ignorant mothers knowing that one of these voluntary ladies may call in unexpectedly has a great moral effect.

These ladies have kindly undertaken the following duties:—

1. To advise expecting mothers on the management of their health.

2. To follow up the notification of births, and to visit the homes when a midwife has ceased to attend.

3. To note the conditions of ignorant feeding, or of non-supply of sufficient and nourishing food, and to take judicious steps to correct these evils.

4. To give advice on the proper feeding of infants; to warn mothers against premature weaning; to inculcate in particular the importance of breast feeding until the teeth appear; and, above all, of the avoidance of the use of foul feeding-bottles.

5. To promote and encourage the practice of weighing infants regularly, and to instruct or remind mothers on points of simple hygiene.

6. To note any insanitary or foul conditions in any of the homes visited, and in any of the inmates of the same, and to report these points to the medical officer of health under whom they work.

These ladies visit and re-visit the cases forwarded to them, and keep them under observation.

The greatest care is exercised to avoid touching upon the *domain of the family doctor*—these are never visited—except by request of the usual medical attendant. Great care is exercised by these ladies in any matter which can have even the appearance of diminishing parental respect, and particularly maternal responsibility. These ladies have also opportunities of impressing upon people the importance of hygiene and temperance, and they also deal with the home, with the person, the question of good nourishing food, fresh air, sunshine, cleanliness, etc., etc.

The total number of certificated midwives in Rotherham at the present time is 16. These midwives attend, approximately, 50 per cent. of

the whole births. About 25 per cent. of the births are attended by medical men, and about 25 per cent. by unqualified women, etc.

During the year the Midwives Committee of the Rotherham Corporation passed a resolution agreeing to pay a fee of £1 rs. where a medical man was called in at the request of a midwife in cases of flooding, convulsions, and rupture of the uterus, provided that the wages in each family did not exceed the amounts stated in the following table:—

TABLE 3.

Man and wife	...	£1 1 0	per week.
Parent or parents and 1 child	...	1 3 0	"
" " 2 children	...	1 5 0	"
" " 3 "	...	1 7 0	"
" " 4 "	...	1 9 0	"
" " 5 "	...	1 10 6	"
" " 6 "	...	1 12 0	"
" " 7 "	...	1 13 0	"

This resolution was passed on my request, and was carried at one meeting of the Council, but, unfortunately, at the succeeding meeting it was rescinded. This was chiefly owing to the fact that the medical men in Rotherham did not consider the terms sufficiently remunerative. Consequently on a later date, after the receipt of a communication from the Local Government Board, the Rotherham Board of Guardians passed the following resolution:—

"That a letter be sent to the medical men and certificate 1 midwives practising within the Poor Law Union of Rotherham, informing them that the Guardians will under cases arising on Rule 18 of the Central Midwives Board's Regulations, on being satisfied that the woman is too poor to pay the medical fee, be prepared to exercise their powers under the section, and to pay a fee to the medical men called in of 10s. 6d. for ordinary cases and £2 for difficult cases of confinement."

This is now in operation in the Borough of Rotherham.

There can be no question that the Midwives Act is emphatically a public health measure.

The chief objects its promoters had in view were the lessening of the mortality (infantile) and sickness associated with child-birth; the importance of this field for preventive effort is apparent from the fact that, in 1906, the number of women who died in England and Wales from diseases associated with pregnancy was no less than 3,757, equivalent to a rate of 4.02 per 1,000 births. In the preceding ten years, the death-rate averaged 4.48 per 1,000 births.

For every case of puerperal fever there is in addition a large amount of non-fatal sickness associated with this mortality, and for every death from this disease there are probably half a dozen cases of chronic illness, which causes continuous suffering or prolonged or permanent disablement.

The prevention of this enormous amount of preventable suffering is alone a matter of great importance. In actual administration the scope of the Midwives Act has been extended.

The work of the midwife has been co-ordinated with that of the female health visitor, and the Act has become a potent measure for the prevention of infantile mortality. The executive officers on whom the administration of the Act fall are the medical officers of health of the Counties and the County Boroughs and the annual reports of these officers afford ample evidence of the fact that the Midwives Act will in time become one of the most valuable public health measures.

The experience of the last few years has brought into prominence various important questions relating to midwives and their work that will require careful consideration, and probably improved legislation, before the full benefit of the Act can be reaped.

The following tables give the percentage of mothers and children living, and the infantile mortality rate, which have occurred amongst the cases attended by the sixteen midwives practising within the borough, together with the prizes awarded and the number of marks obtained during the years 1907 and 1908.

TABLE 4.—1908.

No. of Midwife.	Cases attended.	Percentage of children living.	Percentage of mothers living.	Infantile mortality rate.
1	2	100	100	—
2	3	100	100	—
3	97	94.8	100	51
4	17	94.1	100	59
5	148	93	99	47
6	41	92	100	73
7	60	91.6	100	83
8	76	93.4	97	66
9	20	90	100	100
10	32	87.5	100	125
11	47	89	98	106
12	174	87	99	120
13	85	87	100	129
14	30	86.6	100	133
15	74	88	98	91
16	28	82	100	178
17	3	66	100	333
18	2	50	100	500

TABLE 5.

	Number of cases attended.	Death rate per 1,000 births.
1	3	—
2	1	—
3	118	50
4	18	55
5	16	62
6	68	73
7	40	75
8	172	87
9	66	90
10	44	90
11	50	100
12	10	100
13	10	100
14	100	120
15	58	120
16	81	135
17*	25	200
18	10	200
19*	21	238
20*	12	333
21*	—	—

* Removed from Midwives Roll.

TABLE 6.—GIVING DETAILS OF 939 BIRTHS DURING 1908.

No. of midwife.	No. of cases.	Children living.	Children deceased.	Mothers living.	Mothers deceased.	Breast fed.	Bottle fed.	Sill Births.	Medical help required.
1	2	2	—	2	—	2	—	—	—
2	3	3	—	3	—	3	—	—	—
3	97	92	5	97	—	88	8	1	10
4	17	16	1	17	—	14	3	—	2
5	148	141	7	147	1	136	8	4	4
6	41	38	3	41	—	35	4	2	1
7	60	55	5	60	—	46	12	2	4
8	76	71	5	74	2	66	6	4	5
9	20	18	2	20	—	16	3	1	5
10	32	28	4	32	—	28	4	—	1
11	47	42	5	46	1	35	7	4	*
12	174	153	21	173	1	149	20	5	12
13	85	74	11	85	—	76	6	3	12
14	30	26	4	30	—	23	7	—	1
15	74	67	7	73	1	63	6	5	18
16	28	23	5	28	—	19	8	1	*
17	3	2	1	3	—	2	1	—	1
18	2	1	1	2	—	1	1	—	—
Total	939	852	87	933	6	803	104	32	76

* Not notified.

TABLE 7.—PRIZE LIST, 1908.

Registered No. of midwife.	Number of cases attended.	Percentage of mothers living.	Percentage of children living.	Number of marks obtained.	Total possible (mother and child counting two).
1st. 4,924	97	100	94.8	194.8	200
2nd. 1,993	148	99	93	192	200
3rd. 2,910	60	100	91.6	191.6	200

Corresponding numbers of prize winners on Table 5 are 3, 5 and 7.
It will also be noticed that the midwife who gained first prize in 1907 has won the second prize in 1908.

TABLE 8.—PRIZE LIST, 1907.

Registered No. of midwife.	Number of cases attended.	Percentage of mothers living.	Percentage of children living.	Number of marks obtained.	Total possible (mother and child counting two).
1st. 1,993	118	100	94.08	194.08	200
2nd. 2,144	68	100	92.7	192.7	200
3rd. 3,914	40	100	92.5	192.5	200

During the year 1908 six cases of puerperal fever have been reported by the certified midwives. Whenever a midwife has been in attendance in Rotherham upon a case of puerperal fever or from any other illness supposed to be infectious she is compelled to disinfect herself and all her instruments and appliances to the satisfaction of the sanitary authority, and all her clothing has to be thoroughly disinfected before going to another labour.

All washable clothing must be washed and other clothes disinfected by the sanitary authority.

VERMINOUS HAIR IN PUPIL TEACHERS.—During 1908 I examined, with the assistance of Dr. Holmes and a nurse, 28 male pupil teachers and 72 female, and also 26 male pupil teacher candidate scholarship holders and 54 female. . . . The hair of the girls was verminous in 44.4 per cent., but only one male was affected. The different proportion in which the two sexes are affected is due solely to the fact of the girls wearing their hair long and usually loose and unconfined. The regulation requiring all those engaged in teaching to wear their hair plaited or tied back has proved most useful, as it prevents the spread of infection by the teacher's loose hair sweeping over the heads of the children as she passes along behind them to inspect their work. No pupil teacher or scholarship holders are passed in the medical examination until the hair is absolutely free from any trace of vermin. So important do the Education Committee consider it that the elder pupils who may be contemplating entering the teaching profession should set an example as regards this plague of vermin that they require all fee-paying scholars in the secondary schools directly under the Committee's control to have their hair examined before admission. The result has been so satisfactory that of a large number examined in July as pupil teachers, whose hair had been set right at the general inspection six months previously, not one had relapsed; but all were quite free from vermin, although many of them had been employed in teaching, and so had been exposed to infection.—*Annual Report of Dr. Henry Handford, County Medical Officer of Health, Notts.*

NOTES ON CASES OF POISONING BY CARBON MONOXIDE FROM AN UNUSUAL SOURCE.

By T. M. TIBBETTS, M.D. (Lond.), D.P.H., M.R.C.S.,
L.R.C.P., Medical Officer of Health, Quarry Bank.

POISONING by carbon monoxide is of so frequent occurrence that its symptoms, diagnosis, and treatment are now well known. In most cases the source of the gas can be readily ascertained, and it is because of the obscurity attending the origin in the group of cases about to be described that I am led to record them.

Carbon monoxide plays an important part in poisoning by coal gas, by the gases in coal mines, and especially on the continent by the products of burning charcoal.

Cradley Heath is a small iron manufacturing town on the South Staffordshire coal field, and from its blast furnaces, now disused, there were immense quantities of mineral refuse or "slag," which was deposited on waste land or used for levelling up hollow places. Other refuse, such as that from coke ovens, night soil, or road scrapings, was liable to be deposited below or above the slag. With a top dressing of soil the land might finally be used for garden or agricultural purposes. Coming direct from the furnaces the slag was at first intensely hot, and the process of cooling is sometimes so prolonged, or the combustion of surrounding substances so slow, that such refuse has been known to smoulder for many years. A period of twenty-five to thirty years is said to be comparatively common. Superficially there may be nothing, or at most only the occasional escape of a little steam through fissures in the soil, to indicate the subjacent combustion. A later generation may, in fact, be entirely ignorant of the dangerous formation of the land.

About half a mile outside the town, in a semi-rural locality, is a block of six dwellings built in 1897 on or near such a site as that above described. They are apparently well built, and being attractive in appearance were occupied by families of the superior artisan class. Apart from bedrooms and outbuildings each house consists of a front parlour and a back living room on the ground floor. Into the latter room the cellar and the stairs open, being, of course, shut off by doors.

The cellars are not drained, but the premises are connected to the deep sewer in the adjoining thoroughfare.

For convenience in reference the houses may

be numbered from 1 to 6 in series, No. 1 being the nearest to the brow of a steep slope about 80 yards away, which is evidently the end of the old refuse tip, and is now grassed over. A hundred yards below runs the river Stour, immediately at the foot of the slope. With the exception of No. 2 the houses are supplied by gas from the local mains. There are no other dwellings within 40 yards or more.

On May 1st of the present year the population of the houses in question numbered 21, distributed as follows:—

No. 1. Homer ... 2.	No. 4. Plant ... 7
No. 2. Lloyd ... 5.	No. 5. Morgan .. 2
No. 3. Tibbetts... 2.	No. 6. Taylor ... 3

At 5.30 a.m. of this day, two of the occupants of No. 2, Mr. Lloyd and his son, were preparing to set out for work, but the father, not feeling well, remained at home. He was subsequently found at about 6 a.m. lying unconscious on the floor of the living room. A medical man was called, and Lloyd was believed to have had a fit, although as he was known to have partaken of fish on the previous night, fish poisoning was also suggested. He was carried to bed, and according to his statement recovered about 7.30 a.m., when on calling for his wife, and having no reply, he went downstairs and found his wife and a son and daughter lying unconscious on the floor of the living room. He remembers nothing more, but at about 1 p.m. both he and they were found lying still unconscious on the same floor. Some time previous to this, Mrs. Tibbetts at No. 3 was so ill that a doctor was called, but she was supposed to be suffering from the shock of Lloyd's illness, having been to his assistance in the early morning. Just before 1 p.m. it was first noticed that the Morgans at No. 5 had not been seen that morning. On forcing an entrance into the house, Mrs. Morgan was found in bed upstairs, unconscious and "nearly black in the face." Her husband had gone to work at 6 o'clock. The medical attendants on the other cases had by this time left, and my assistant, Dr. Kelly, was summoned to Mrs. Morgan. At first, knowing nothing of what had taken place, he suspected uræmia, but being informed as to the earlier cases, instituted a systematic enquiry, and it was then that the unconscious Lloyd family was first discovered. Drs. Silvers, Waugh and Darby, who were at hand, assisted Dr. Kelly, and it soon became evident that they had to deal with poisoning of a subtle nature. The water and gas supplies and the drainage were investigated

with negative results. After remaining indoors with the patients for an hour or so, the medical men and several of the other helpers experienced some giddiness, headache and muscular weakness. Dr. Kelly, in an effort to remove one of the victims, lost all power, and dropping his charge nearly fell headlong. The unconscious patients, numbering six, were now carried into the open air. Seven other residents were more or less severely affected, the incidence of sickness being in sequence from houses No. 1 to 6—1, 4, 1, 3, 2, 2 cases.

At 3 p.m., when I first saw the patients, four were still totally unconscious; they had been laid in the shade in the back yards of the houses. The remaining two, now partially recovered, had been placed "in the sun," which was at the time very powerful. The beneficent influence of warmth did not strike us at the time, but has been frequently noted in the treatment of "monoxide" poisoning, and may have played an important part in speeding the recovery of these two patients. There was no perceptible odour in any of the rooms, cellars included, and the medical men agreed that this was the case when they first entered them. With the exception of Mrs. Lloyd, the countenances of the unconscious patients when I first saw them were strikingly placid and natural. There was neither cyanosis pallor nor flush, the cheeks, lips and ears being of a healthy flesh pink. The eyes were partially closed, the conjunctivæ rather congested, the pupils distinctly but not extremely contracted, the breathing somewhat heavy, and in one case stertorous. In Mrs. Lloyd's case there was frothing at the mouth, and occasional jerking movements of the arms and legs. I was told by the medical attendants that both Mrs. Lloyd and Mrs. Morgan were convulsed when they were first seen. The limbs were slightly rigid and extended. The knee jerks were exaggerated, and in the case of Mr. Plant, who was attacked later, there was a marked extensor plantar reflex (Babinski's) during unconsciousness, which disappeared on recovery next day. I did not examine the other patients for this symptom, as they were fully dressed and in the open air.

The pulse was in each case rapid (100—110), small and feeble; the temperature in the only two cases in which it was taken was subnormal (98 deg.—97.8). Knowing already the nature of the subsoil in this vicinity, this and the appearance of the patients convinced us that the diagnosis of gaseous poisoning was correct, and carbon monoxide was specially suspected.

A supply of oxygen was sent for, and in the meantime, having procured two caged goldfinches (the only small animals available), we placed one at the top of the cellar steps in No. 2. In ten minutes it lay apparently lifeless, but revived in the open air. After the cellar door had been closed for a few minutes the other bird was placed at the same spot and was found dead at the end of five minutes. The bird first used was placed in a similar position in No. 1, and was dead in five minutes. Venesection was performed on Mrs. Lloyd and about eight ounces of blood taken from her arm. The slight operation did not rouse her. The blood flowed readily and we were unable to detect any deviation in colour from ordinary venous blood sufficient to aid us in diagnosis.

I made a rough spectroscopic examination shortly after, both of this blood and of that of one of the dead birds. The double band, irreducible by ammonium sulphide and specially characteristic of carbon monoxide, was unmistakably shown in both specimens.

As, in spite of oxygen freely administered, there was no sign of improvement, two of the patients were removed to the Guest Hospital, Dudley, and the remainder to the homes of friends. The other occupants were urged to vacate their homes. At No. 4 one of the birds had been taken into the cellar by a person who remained with it for ten minutes with no apparent ill-effect on either. The whole family here at this time seemed to be little affected except so far as could be attributed to shock and excitement. For this reason Mr. Plant, a man of sixty-four years of age, maintained that the theory of poisoning was pure imagination on the part of the medical men, and in spite of warnings and solicitations stayed the night in the house. He went to bed upstairs with windows open, and when I saw him next day at 10 a.m. was looking pale, owing, as he said, to having smoked too much. Next night, his bed having been removed, he stayed in the living room. He says he smoked well into the night, but does not remember lying on the couch near the window, where he was found unconscious at 5.30 next morning. At 10 a.m., when I next saw him, his appearance resembled that mentioned in respect of Mrs. Lloyd, but in addition the skin of his face and chest was florid and he had scarlet patches on the backs of both wrists and forearms, as though he had been firmly grasped by strong hands. His breathing was irregular, of a rhythm approximating that of the Cheyne

Stokes type. The temperature was 98 deg. and pulse 104 and feeble. As already stated, I obtained a marked extensor plantar reflex, which was absent after his recovery next day. The knee jerks were exaggerated, but I failed to obtain ankle clonics.

On May 1st it was reported that a canary had died in a cage upstairs in one of the houses, and a dog had been found almost helpless, but had recovered in the open air.

On May 3rd, in the presence of Dr. Beasley (the Medical Officer of Health) and myself, Mr. W. Chapman, an experienced local mining engineer, conducted further investigations. In the cellars Nos. 1 and 2 a miner's (Davy) lamp was extinguished when lowered to within 1 ft. of the floor; in No. 5 when within 4 ft. 6 in.; in the other cellars at varying depths. The peculiar smell of what is locally known to miners as "fire stink" was now easily perceptible in the cellars, but there was nothing found there to explain its presence. Notwithstanding that the cellar windows had by this time been opened for two days, Mr. Chapman concluded that carbonic acid (CO_2) was still present, especially in the lower strata of the cellar air, in sufficient proportion to destroy life rapidly. Inspection of the exterior of the buildings showed several cracks, recent and old, doubtless due to the subsidence of the foundations at different times, the general trend being towards the sloping bank and river.

At 64 and 90 yards respectively from No. 1, between it and the foot of the slope, were two deep sewer inspection shafts, which had been built before the hollow was filled in with *débris*, and from the further of these rose vapour and "fire stink" in abundance; the other was clear, and free from odour. The sewage could be seen running rapidly, the fall at this spot being very great. Near the foot of the slope and about 100 yards from the house vapour issued from the ground at several points, indicating underground combustion.

A noteworthy statement, in which all the householders concurred, was that from their first occupation of the houses no sooner was water thrown down in the cellar for the purpose of cleansing than it vanished instantly, showing the extreme porosity of the soil and the free communication between the ground air and that of the cellars. Although the cellars had been regularly used, no decided odour had ever been noticed.

As to the source of the poison, which was

now beyond question of a gaseous character, four distinct theories were raised:—

1. COAL GAS.—There was nothing to support this view. No. 2 was not supplied with gas, but was the first and worst affected. The characteristic smell of gas was absent, and the dangerous experiment of taking a lighted candle into the cellar, which was foolishly risked by one of those present, resulted only in its extinction.

2. SEWER AIR.—The cellars were not drained, and the sewer near the houses was apparently intact. The condition of the nearest sewer ventilator was satisfactory.

3. GASES FROM THE NEIGHBOURING COAL MEASURES.—This was strongly suspected, but on enquiry it was ascertained that the nearest coal measures were 280 yards below the surface, and were not burning. That gases could reach the surface from such a depth, sufficiently concentrated to produce serious results, was considered highly improbable. An occurrence in 1891 at Darlaston, a town eight miles away, described by Dr. G. Reid, of Stafford, in PUBLIC HEALTH, April 1891, was traced to the entrance of gases from a burning mine near the premises. Dr. Reid pointed out that the cold weather and frozen state of the surface were probably important factors in this case. The reverse conditions obtained in the case under discussion, as the weather was particularly fine and warm.

4. GASES produced by the underground smouldering of refuse, aided by the subsidence of land.—The evidence in support of this view has already been sufficiently stated, and in the minds of those on the spot was considered conclusive.

The houses are said not to have been built directly on the tip, but on soil removed from the main road when the deep sewer was laid. In any case the porosity of the soil and the extracting power of the heated rooms could bring gases from some considerable distance. The bodies of the birds were subsequently examined by Dr. L. C. S. Broughton, of Langley Green, and myself. The appearances were consistent with that produced by CO poisoning. The pectoral muscles seen through the skin were of a dullish red colour, but immediately on dissection they and the liver and heart were bright red.

Dr. Broughton also undertook the exact measurements of the spectroscopic shadows, and the chemical examination of the blood

taken from Mrs. Lloyd, and found that CO was present in considerable quantity.

Further careful enquiry elicited the fact that although no alarming symptoms had shown themselves until May 1st, most of the families had suffered for the previous six months from headache, nausea, debility and malaise, relieved when they were away from home.

I was unable to chemically examine the air from the dwellings for carbon monoxide, owing to the difficult technique involved. Three ounces of lime water shaken in a Winchester quart of the air in cellar No. 2 became milky white, indicating the presence of CO_2 in considerable quantity.

The air of the cellar was not irritating to the eyes; nor did it, after four hours exposure, alter the tint of a filter paper previously moistened with a solution of lead acetate. These facts were taken to exclude the presence of SO_2 or H_2S in appreciable quantity.

It is difficult to suggest a remedy. The smouldering deposit is so enormous that it cannot well be treated directly. Further subsidences are practically inevitable, so that impervious beds and walls will be liable to fracture. To re-lay the cellar floor in concrete, and similarly face the cellar walls, and to establish cross ventilation in the cellars by windows at opposite sides and through the party walls might be sufficient; but for further protection the cellar doorway should be permanently built up, and the floors of the living rooms relaid in cement, before the houses are re-occupied. The occurrence is instructive as showing the risk of building on made ground, and the importance of air-tight foundations.

A record of all made grounds, including refuse tips, disused pit workings, and cinder heaps, would be invaluable as a protection against risk, and should be accessible to all prospective purchasers of land.

The value of small animals as danger signals and for diagnostic purposes, and the difficulties attending the early diagnosis in isolated cases of ground air poisoning are also well illustrated.

In reply to an enquiry made to Dr. G. Reid as to the similar occurrence at Darlaston in 1891, I received the following interesting communication:—"Oddly enough, I had a similar occurrence in Sedgley (also a South Staffordshire town) the year after the Darlaston cases, but I cannot find any report of such cases. In the Sedgley cases one woman died who was sleeping on the ground floor in the kitchen, forty pigeons died in a wooden outbuilding

belonging to another house, and several people were seriously ill in different localities widely apart, the reason for this being, in the case of Sedgley, that the formation was fissured rock, so that the gas escaped where fissures happened to be under cellars, whereas in the Darlaston case those who suffered lived in a circumscribed area, the formation being gravel (bunter beds)."

Winter Blyth, who describes* Dr. Reid's Darlaston case as probably unique, also quotes, as recorded by Taylor, an unusual case of poisoning in 1857 at Cleaton Moors in some cottages built on iron slag containing sulphides of calcium and iron: "A heavy storm of rain washed through the slag and considerable volumes of H_2S with, no doubt, other gases diffused during the night through the cottages, killed three adults and three children."

Since writing this account one of the victims has died, after a lapse of six weeks; one has developed melancholia, and two others are somewhat seriously affected. The remainder have apparently regained their normal health.

PEDICULI CAPITIS IN SCHOOL CHILDREN.—For *pediculi capitis* the mothers are advised to comb the hair every night, and wash once a week with soft soap; at the same time all nits to be cut out from under the hair. In more marked cases where the hair is too dirty, it is advised that the whole of the hair be cut off. In the case of heads exhibiting merely a few nits, the mothers are asked to cut out the nits, wash the head every week with soft soap, and comb every night without fail. For *pediculi capitis* accompanied by sores, we recommend cutting the hair as short as possible, and washing every day with soft soap; this treatment will clean the sorest head in about a fortnight, during which time the child is excluded from school. The great stumbling-block to progress is the unwillingness of mothers to sacrifice a girl's hair, even when hopelessly infested with vermin and their eggs, and covered with sores, which are often regarded by parents as "heat sores" or eczema. A prevalent idea amongst mothers is that the condition is due to ill-health in the child, or again that it is entirely one of idiosyncrasy; hence arises the notion that "some heads breed lice"—presumably by a process of spontaneous generation. The existence of such widespread and deep-rooted ignorance, together with the unpopularity, with some of the mothers, of the above-mentioned radical measures, renders the war of extermination of vermin no light undertaking.—*Annual Report of Dr. Tattersall, Medical Officer of Health, Salford.*

* Poisons, 1906.

CENTRES FOR INFANT CARE IN
BERLIN.

IN a recent number of the *Zeitschrift für Hygiene und Infektionskrankheiten* there is an interesting paper by Dr. L. Schaps which gives a short account of the origin, development, and organisation of certain institutions in Berlin for the care of infants. These were started by a fund known as the Smith-Gallisch Charity, and are managed in close connection with the organisation for waifs and strays and the poor law.

They are founded to give advice to mothers on the rearing of infants, to give premiums to mothers who suckle their infants, and to find wet-nurses or suitable milk for those who cannot. They are mostly situated in block dwellings, from which they are likely to draw their *clientèle*. The accommodation consists of a waiting-room, a consultation-room, an ante-room, a small laboratory, and apartments for a nursing and house staff.

From the waiting-room the mothers are conducted into the ante-room, where general inquiries are made into the social condition, etc., of the parent, and the infants are undressed and weighed. The weight of the suckling mothers is also taken at stated times to see if they are keeping in good health. If suckling appears to be injuring them they are referred to the proper quarter for advice.

Children which are seriously ill are not treated here, but referred to the poor law medical officers; but slight disturbances connected with diet are advised upon here. Those who can afford a private doctor are refused treatment or advice. At the consultation the mothers are advised both orally and by leaflets, and breast-feeding is encouraged in every way, premiums being given to mothers for doing this where the circumstances require it. The amount is not fixed, but the average amounts to about 80 pfennig per case per diem (10d.).

In those cases in which the infants cannot be suckled a wet-nurse is often found among the *clientèle*, or if this fails they are given tickets by which they can obtain milk at 2½d. per litre, a reduced price, or free. The last is not encouraged. The milk may be sent to the homes, or it may be obtained at one of the "care centres" or a special milk dépôt. It is pure milk varied in composition to suit the various cases. Most of the "care centres" have their own kitchens, where specially prepared food is given out for delicate children. The homes are supervised by female health visitors to see that the physician's directions are carried out and the general hygiene of the home attended to.

There are seven centres in Berlin. Four were started in May, 1905, a fifth was added in May, 1906, and in June, 1907, a sixth and seventh.

The management is very strict, the physician being the controller; and he may allow nourishment free for eight days. If this is to be continued longer it can only be done after the proof of poverty by the municipal authorities.

The centres are evidently very popular, and becoming more so, as the following figures show:—

NUMBER OF INFANTS TREATED.			
Care Centre.	1905. May to Dec.	1906. May to Dec.	
I. ...	2,325	2,705	
II. ...	430	1,424	
III. ...	477	810	
IV. ...	764	1,522	
V. ...	1,197	1,550	April to Sept., '08.
VI. ...	710	577	June, '07, to March, '08. April '08, to Sept., '08.
VII. ...	1,145	1,063	June, '07, to March, '08. April, '08, to Sept., '08.

CORRESPONDENCE.

The Editor does not accept responsibility for the opinions of correspondents.

To the Editor of "PUBLIC HEALTH."

GRIESS TEST FOR NITRATES.

SIR,—It is often troublesome to apply this test on account of the rapid deterioration of the solution and the time and trouble it takes in the ordinary way to make and decolorise it. I find the following a rapid and economical way of making up small quantities:—

Weigh out a dozen or so separate grammes of the metaphenylene-diamine hydrochloride powder, and put each into a small (about 2 in. by ½ in.) test tube and cork. These are for stock, and can be labelled and put away in an air-tight jar.

When requiring to make the solution take one of these gramme tubes and empty the contents into a small spouted beaker (of 50 c.c. capacity or less), add 20 c.c. of distilled water, and stir up with a glass rod. Then add about 25 grm. (rather less than will lie on a threepenny piece) of finely powdered animal charcoal, and again mix in the beaker. Pour the mixture out into a small test tube (about 4 in. by ½ in.), put in the centrifuge, and turn for about 1½ minutes.

The result will be a small test tube of quite clear solution with nearly all the charcoal at the bottom (only a few bits remaining at the top), and from which sufficient can be pipetted off for half a dozen or more tests.

I use the 4 in. by ½ in. tubes, as they just fit one of Baird & Tatlock's small high-speed centrifuges; but of course any other size of tube or centrifuge is applicable.

Yours faithfully,

J. S. TEW,
Medical Officer of Heath,
West Kent Combined Sanitary District.

PROCEEDINGS OF THE SOCIETY OF
MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856.

RECONSTRUCTED 1888.

INCORPORATED 1892.

Southern Branch.—Minutes of Annual Meeting of Branch held at the Pier Hotel, Ryde, Isle of Wight, on Friday, June 25th, 1909. *Present*:—Drs. Lauder (President), Forbes, Fraser, Gibson, Griffith, Livingstone, Lyster, Milburn, Stott, and Stephens.

The minutes having been taken as read, and being confirmed, the annual balance sheet of the Branch as passed by the Council was laid on the table, and was approved by the meeting.

On the recommendation of the Council of the Branch the following were elected officers for the year 1909-10:—President, Dr. R. L. Legate, of Christchurch; Hon. Secretary, Dr. Griffith; Hon. Treasurer, Dr. Stott; and Representative to Council of Society, Dr. Willoughby.

There being no other business, Dr. Gibson (Medical Officer of Health, Isle of Wight) read a paper entitled "A Pure Milk Supply," dealing especially with the matters referred to the Branches of the Society, viz., the formation of a service of veterinary inspectors and regulations as to cowsheds.

He pointed out that under the Board of Agriculture's Tuberculosis Order, 1909, a service of veterinary inspectors would be formed, but this was already anticipated in the island by many farmers, who were employing veterinary surgeons to examine their cows. He dealt in detail with several methods of improving cowsheds, especially as to ventilation and cleanliness; he believed that as to sterilising milk was wrong, and ought not to be necessary; and he thought that all dairymen should have a licence renewable annually, which they should show if required. He recommended a uniform code of regulations for cowsheds, but time should be allowed to produce alterations.

In the discussion which followed Dr. Stott spoke of spraying machines for limewashing roofs, and of the importance of having coolers placed in proper situations. Dr. Stephens recommended members to see the Agricultural Show, the authorities of which were trying to improve the state of cowsheds and of the dairying trade. He had found dried milk of value in cases of epidemic enteritis. The other members also took part in discussing Dr. Gibson's paper and the Tuberculosis Order. After lunch the members journeyed in motor cars, one of which was provided by Dr. Gibson, to the National Consumption Hospital, Ventnor, over which they were shown by Dr. Gilchrist; and then to Newport, where Dr. Gibson provided tea.

A hearty vote of thanks was given to Dr. Gibson

for his entertainment and for making all the arrangements of the meeting.

Midland Branch.—A Meeting of this Branch was held at Messrs. Cadbury's Works, Bournville, on July 1st, 1909. *Present*:—Dr. Reginald Green (President), Drs. T. J. Dabell, J. H. Garrett, Philip Boobyer, Herbert Manley, Herbert J. Fausset, James Clarke, T. Ridley Bailey, H. D'Arcy Ellis, H. S. Jones, F. Hollinshead, T. Stanley Robinson, Henry Malet, Francis H. May, Lawrence W. Pole, A. S. Underhill, T. M. Tibbetts, A. E. Remmett Weaver, A. Hamilton Wood, W. Sisam, J. Orton, and E. H. Snell. Apologies were received from Drs. G. Reid and J. Robertson. Owing to the kindness of Messrs. Cadbury the members were conducted through the works, and then entertained at tea, after which the following business was transacted:—

Matters referred to the Branch:—It was resolved that the alteration of the time of meetings of the Society from the evening to the afternoon is desirable, and that the Branch is not in a position to express an opinion on the provision of a "mess." It was resolved that the lending out of books from the library of the Society is undesirable.

It was proposed by Dr. Garrett, and seconded, that the appointment of veterinary inspectors should be by a central authority, and not by a local authority. Dr. Manley proposed, and it was seconded, that the consideration of this question should be adjourned. This was carried.

The following officers were appointed for the year:—President, Dr. Francis H. May; President-elect, Dr. J. H. Garrett; Vice-Presidents, Drs. Alfred Hill, Henry May, H. Manley, and Reginald Green; Council, Drs. Barwise, Reid, Boobyer, Malet, Robertson, Ridley Bailey, and J. Orton; Treasurer, Dr. Bostock Hill; Representatives on the Council of the Society, Drs. Manley and Bostock Hill; Secretary, Dr. E. H. Snell.

The draft bye-laws recommended by the Branch Council were considered and adopted in substitution for those existing.

AMENDED BYE-LAWS.

1. The constitution of the Midland Branch is determined by the Articles of Association and Special Resolutions of the Society.

2. The Branch shall be managed by a Council consisting of President, Vice-Presidents, Secretary, Treasurer, and seven members. The election of officers and Council shall take place at the meeting of the Branch held in July. Any member may nominate candidates for election to the Council in writing to the Secretary on or before June 20th each year. The President-elect for the year shall be regarded as a Vice-President. At Council Meetings three shall form a quorum.

3. As far as possible the meetings of the Branch shall be held on the first Thursday in the following months: October, November, December, February.

and March; and one meeting, called the Annual Meeting, shall be held on a convenient date in July. The meeting in October shall be reserved for the President's address.

4. A special meeting may be called at any time by the President or Council. Three days' notice shall be given of such meeting (or in the case of emergency not less than twenty-four hours). No business shall be transacted at such meeting except that on the notice calling the meeting.

5. The Branch shall meet in Birmingham except when otherwise arranged.

6. Seven days' notice shall be given of any ordinary meeting, and the notice shall state the business for the meeting.

7. In all matters not provided for in the Articles of Association and Special Resolutions of the Society or in these bye-laws the decision of the President shall be final.

8. No resolution of which notice has not been given shall be proposed except by the unanimous consent of the meeting.

9. No alteration can be effected in these bye-laws except after due notice.

Arrangements for the next session were considered, and it was resolved not to have an annual dinner.

A hearty vote of thanks was passed to the Corporation of Birmingham for their kindness in allowing the use of a committee-room for the meetings of the Branch. A vote of thanks was also passed to Messrs. Cadbury for their kind hospitality on the present occasion.

The members subsequently visited Bournville village.

North-Western Branch.—Minutes of a Meeting held at the Victoria Hotel, Manchester, on Friday, July 16th, 1909. In the unavoidable absence of Dr. Hamilton (President), Dr. Garstang was elected to the chair. *Present*:—Drs. Paddock, Cargin, Welsh, Wheeldon, Carnwath, Arnold, Hutchinson, Talent, Fraser, Thomas, Hitchon, Paterson, Edlin, Buckley, Daley, Berry, Buchan, Greenwood, Sergeant, Dearden, Wheatley, and the Hon. Sec. (Dr. Barlow).

Drs. Hamilton, Wilkinson, Young and Marsden wrote regretting inability to be present.

Minutes of last meeting were read, confirmed and adopted.

After considerable discussion the election was confirmed of those officers who had been inadvertently elected at the previous meeting.

Dr. Garstang proposed, and Dr. Barlow seconded, that rules be adopted by the Branch to govern the future election of officers. It was ultimately decided to defer this question until the first meeting in next session, when draft rules are to be submitted.

It was also decided that copies of the book of

constitution and bye-laws as recently amended be sent round to members of the branch.

In the unavoidable absence of Dr. H. Corbin, his paper, "Small-pox from Imported Cotton," was read by the Hon. Secretary.

In the discussion which followed, Drs. Buchan, Sergeant and Dearden took part, and a hearty vote of thanks was accorded to Dr. Corbin at the close.

PARENTAL IGNORANCE.—Many old-fashioned remedies for various ailments are quite prevalent, such as home-baked bread being good for young infants, and even in a few cases the rain that falls on Good Friday being a cure for ophthalmia! The mothers have on the whole been interested and anxious to learn about their babies; but the repressed smile that means, "I should have my work cut out if I did all those fiddling things" is often seen, and will take much patience and time to eradicate.—*Annual Report of Dr. T. Ridley, Medical Officer of Health, Bilston.*

THE ADVANTAGE OF GROOMING COWS.—A few farmers, I am glad to be able to state, are regularly grooming the cows, with great advantage to the cleanliness and well-being of the cows. Some of those who at first ridiculed the proposal are now strong advocates of daily grooming, because they find it improves the general condition of the cows, renders them less irritable and less subject to local parasitic infections. Another great advantage is that it lessens the faecal contamination of the milk.—*Annual Report of Dr. Alex. Anderson, Medical Officer of Health, Wortley.*

WHEN A HIGH BIRTH-RATE IS NOT DESIRABLE.—Unfortunately the people who have the largest families are, generally speaking, those who have the smallest incomes. The limitation of the number of children is not practised by the very poor, to whom it is almost a necessity, but by the class who are much better able to provide for a numerous progeny. Moreover, in a period of depression in trade such as we passed through in 1908, and from which we are still suffering, all the effects of poverty are accentuated. The expectant mother is forced to continue working in the factory up to the last allowable day; she does not have the necessary rest nor the necessary nourishment; in many cases her child either dies because born too soon or is ill-developed and ill-nourished, and after a brief period is carried off by the first child ailment it may suffer from. A high birth-rate is not desirable under these circumstances, and fewer children of much better quality would be much more satisfactory.—*Annual Report of Dr. Wheeldon, Medical Officer of Health, Middleton.*

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SEWER AIR AND SEWER VENTILATION.

THE importance of sewer air as a factor in the causation of disease is a matter on which there has been considerable fluctuation of opinion among public health workers. To the earlier epidemiologists nothing seemed clearer than that sewer air was capable of spreading fever. Numerous outbreaks were attributed to this cause, two of the most remarkable of these being the outbreak of enteric fever in Worthing in 1865 and the outbreak of cholera in Southampton in 1866. The former was investigated by Sir George Buchanan and the latter by Professor E. A. Parkes, and both these eminent epidemiologists concluded that the cause of the outbreak was to be found in the pollution of the air by faecal effluvia derived from the sewers. The deadliness of sewer air became a popular belief, and much ingenuity was expended in designing drainage systems that should effectually exclude sewer air from dwelling houses. When, however, bacteriology began to be applied to public health work, evidence was brought forward that appeared to show that the influence of sewer air in propagating disease had been greatly exaggerated. Lawes and Andrewes, in their investigations made on behalf of the London County Council in 1894, satisfied themselves that sewer air did not, except to a slight extent, take up bacteria from sewage, and that such micro-organisms as are present in sewer air were probably derived from the outer atmosphere. These results appeared materially to simplify the problem of sewer ventilation; for those who objected to offensive smells arising from surface roadway gratings could always be told that as regards bacterial content the air of sewers was, if anything, superior to the outer atmosphere.

Recent bacteriological work has, however, tended to justify the views of the older epidemiologists. Major Horrocks and Dr. Andrewes, employing a much more refined and elaborate technique than was at the command of the earlier workers, have shown that the view that sewage does not readily give up its bacteria to sewer air is incorrect. They find that under ordinary circumstances characteristic sewage bacteria may be found in the air of sewers and drains. The mechanism whereby sewage gives up its organisms to the air is still a matter of some doubt, but from Dr. Andrewes' experiments it would appear that the determining cause is droplet contamination from splashing. Dr. Andrewes finds that even in the absence of air currents the influence of droplet contamination extends for at least fourteen feet in a horizontal direction, and for at least twelve feet in a vertical direction from a focus of slight splashing or gurgling, and he infers that in the presence of air currents the influence would be of much wider extent. The degree to which air currents may convey bacteria derived from sewage is, however, a matter on which further knowledge is needed, and in view of the importance of the subject it is to be hoped that Dr. Andrewes' researches may be continued. In the meantime, epidemiologists are justified in holding that sewer gas is a potential danger to health; and it may well be doubted whether the free emission of sewer gas into the streets of a crowded urban community is a practice that can be continued with impunity. It would appear that the problem of sewer ventilation is more important than has hitherto been generally held, and that the escape of sewer gas should only be permitted through openings that can be controlled in such a way that the gas is rendered innocuous before being allowed to mix with the outer air.

THE FORTHCOMING CENSUS, 1911.

THE Council of the Society have recently considered the question of the forthcoming (1911) census, and in connection therewith have adopted the suggestions of the Statistical Committee, under the chairmanship of Sir Shirley F. Murphy, F.R.C.S., as follow:—

1. That the Census Act of 1910 should provide for a quinquennial census;
2. That the Census Act should be passed as early as possible, and certainly not later than Easter, 1910, in order that there may be time for proper arrangements to be made for taking such census.

These two suggestions have been forwarded to the Home Secretary, the President of the Local Government Board, and the three Registrar-Generals of England and Wales, Scotland, and Ireland, with a request that they may be incorporated in the Act providing for the census of 1911; and it is requested by the Council of the Society that these same two suggestions shall be brought to the notice of the Member of Parliament representing the district by every medical officer of health. The attention of every medical officer of health is, therefore, drawn to this request of the Council, and it is hoped that it will be complied with as soon as possible. Some further important suggestions have also been drawn up and adopted by the Council in connection with the forthcoming census for 1911, and these have been sent on to the three Registrar-Generals of England and Wales, Ireland, and Scotland. The suggestions are as follow:—

1. That no enumeration area should be permitted to extend into more than one sanitary area;
2. That the time has arrived when tabulation census returns should be primarily based on sanitary areas;
3. That the superintendent, or local registrar, or other responsible officer, should be instructed to confer with the medical officer of health before deciding on the enumeration areas;
4. That the age and occupation of the inhabitants of every sanitary area and sub-district of the larger areas should be separately tabulated and published;
5. That, on an undertaking being given not to publish any detailed results obtained prior to the issue of the official report of the census,

medical officers of health should have access to the enumeration papers referring to their respective districts;

6. That the number of children to each existing marriage and the duration of marriage should be included in the schedule;

7. That the number of rooms occupied by each family should be given in every case, and not be limited to families occupying less than five rooms;

8. That the questions as to occupation should require statements as to how employed, *i.e.*, an "employer," "employed," "working on own account" (not employing any assistants), "out of work," etc.;

9. That the ages of each sex should be given for each year, up to eighteen years;

10. That the housing tables should contain separate figures for the numbers of inhabitants under (say) ten years;

11. That the tables of occupied persons should be remodelled to

- (a) Agree with the proposed sub-divisions of persons as given in 8 (*vide supra*);
- (b) Showing separately the married, unmarried and widowed women at each age group;

12. That tables should be framed to show the numbers of children to married couples, according to parental ages and duration of married life;

13. That a complete index of *all* occupations should be included in the report on the census, with the numbers of the order, sub-order and group under which each is tabulated in the occupation tables;

14. That an index be added to the report showing the registration—county and district—in which each sanitary area is contained;

15. That for the purposes of the census "a room" should not include a scullery, pantry, bath-room, water-closet or box-room;

16. That the information supplied regarding housing should include a table showing the number of occupants of houses of various sizes with and without lodgers;

17. That Section 9 of the Census (Great Britain) Act, 1900, should be incorporated in all future Census Acts, together with the addition of the following words:—

"or other district or authority formed for any of the purposes of the Public Health Acts."

THE MODE OF ACTION OF THE BIOLOGICAL FILTER.

By T. CARNWATH, B.A., M.D., D.P.H. Camb.,
Assistant to the Medical Officer of Health, Manchester.

THE origin of the modern biological filter may be traced to Frankland's experiments in 1870.

Its evolution I would briefly sketch as follows:—

In the first place Frankland showed* that the old method of continuous filtration or irrigation was wrong in principle in that no time was allowed for aeration and regeneration. He proved that if the maximum effect is to be obtained from the purifying agencies at work in the soil, a "breathing" or "resting" interval must be allowed between the floodings.

Then came the experiments of Clarke and others for the Massachusetts Board of Health.† They showed that attention must be paid not only to the breathing interval but also to the amount of sewage applied at each flooding. This, they say, should never exceed the water capacity‡ of the filter: as a rule $\frac{1}{4}$ to $\frac{1}{2}$ of this amount is sufficient.

But the water capacity varies with the coarseness or "effective size" § of a material (the "uniformity co-efficient" remaining constant). The coarser, that is, the material the smaller its water capacity, and vice versa. It follows, therefore, that a filter composed of fine materials will be able to deal with a larger quantity of sewage at one time than a coarse filter, but it has the disadvantage that it requires a much longer resting interval for regeneration, and in practice it is found that this latter more than counterbalances the advantage it possesses in the matter of capacity.

These relations may be tabulated thus:—

Effective size.		Dose.		Resting interval.	
Small	...	Large	...	Long	
Large	...	Small	...	Short	

And so we may trace the steps of the transition from the "intermittent filter" of Frankland with its fine materials (clay, sand, etc.), large dose and long resting interval to the "intermittent percolating filter" of to-day, with its coarse materials (clinker, broken brick, etc.), small dose and short resting interval:—

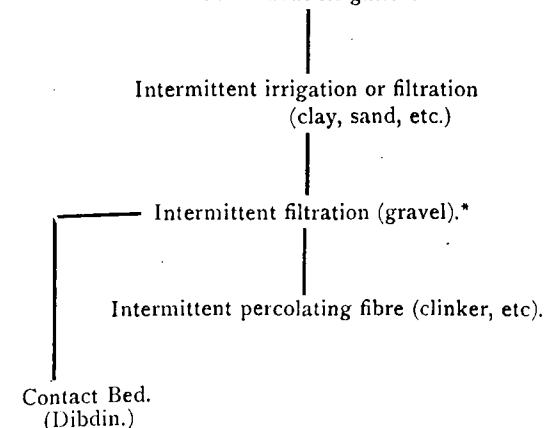
* Report of Rivers Pollution Commission, 1868.

† Annual Reports, State Board of Health.

‡ Annual Report, 1891, p. 435.

§ Massachusetts Report, 1895, *et seq.*; also Kammann u. Carnwath. *Gesund. Ing.* 1906.

TABLE 2.
Continuous irrigation.



For the purpose of this paper one might describe the contact bed as the result of an ingenious (and successful) attempt to rectify the (theoretical) mistake of applying too large a dose at one time.

From the above sketch we see that the different forms of filter met with at the present time are the result merely of variations in the empiric application of one and the same principle, so that a theory or explanation which holds for one will hold for all.

One of the most obvious effects of the filtration of sewage is the rapid production of nitrates. The discovery of a bacterial cause † for this led gradually to the assumption—probably in the main correct—that all the other changes are also the result of bacterial action. The simplicity of this explanation has made it popular. Few stop to enquire *how* the bacteria act—what their exact rôle is in the process of purification—and as a consequence very hazy conceptions prevail on the subject. As an example, I quote the following passage: "The essential conditions (for efficient purification) are very slow motion of very thin films of liquid over the surface of particles having spaces between sufficient to allow air to be continually in contact with the films of liquid. With these conditions it is essential that certain bacteria should be present to aid in the process of nitrification. These we have found come in the sewage at all times of the year, and the conditions just mentioned appear to be most favourable for their efficient action, and at the same time most destructive to them and to all kinds of bacteria which are in the sewage."

From this it is difficult to form a clear conception of how the bacteria are supposed to act:

* Annual Report, Massachusetts Board of Health, 1890, p. 34.

† Schloesing & Muntz—Comptes rendus 1877, pp. 84, 301; *Warrington*—Journal of Society of Arts, 1882.

whether they do their work as they ride with the stream, or whether, taking up their abode in the nooks and crannies of the filter they attack and seize on the organic matter, as it trickles past.

Dibdin, than whom no one has a wider experience or more intimate knowledge of this subject, still apparently inclines to the view that the* purification effected in a contact filter is due to the *direct* action of the bacteria and to fermentative and oxidative changes occurring in the filter during the standing-full period. The intervals between the fillings are for the object of giving the micro-organisms a rest and air. "The contact of the micro-organisms with the effluent to be purified must be effected by leaving such effluent to rest in the filter for a greater or less time according to the degree of purification required, the process being analogous to that of fermentation." "After such quantity of effluent has been dealt with the micro-organisms must be supplied with air."

"The filter must stand empty for an hour or more previous to another filling, and a long period of aeration, say 24 hours, must be allowed every 7 to 8 days. The life of a coke-breeze filter worked in this way is practically without limit."

If the bacterial theory as so conceived be strictly correct, then one may assume, from a knowledge of the course of bacterial fermentations, that the curve of purification will be gradual, rising slowly at first, then more quickly with increase in the number and activity of the bacteria, until finally a maximum is reached, which will be determined by the rate of accumulation of toxic and other products.

But, as a matter of fact, the exact opposite is the case. It has been shown† that the maximum effect in the case of a contact bed occurs during the first five to ten minutes, and that subsequent improvement in the condition of the effluent is slow and comparatively slight. This is especially so in a fine-grained filter, where intimate contact is at once secured, and it obtains not only for sewage containing much matter in suspension, but also for sewage which has been carefully freed from such, as well as for solutions of albumen, peptone, etc.,

* "Purification of Sewage and Water," p. 64.

† Dunbar.—Vierteljahrsschrift f. gerichtl. Mediz. u. öff. Sanitätswesen, 3 Folge, xix. Suppl. Heft., p. 178. cf. Barwise—"Purification of Sewage," p. 127. As pointed out by Barwise, "prolonging the period of contact is useful in permitting the contents of the contact-bed to become intimately mixed," and also in allowing time for the disintegration of any soluble non-absorbable carbohydrates which may be present and their oxidation at the expense of nitrates, etc., which have been formed during previous resting intervals.

where mechanical influences may be considered negligible.

As it is difficult to believe that any appreciable effect can be caused by bacteria or their enzymes in such a short space of time as five to ten minutes, we may conclude that, at any rate, the primary purification effect is due to some other force than a pure bacterial.

In support of this view it has been further demonstrated* that the purifying power of a filter does not disappear simultaneously with a cessation in the activity of the bacteria. Thus when a filter is chloroformed or when a strong antiseptic, such as corrosive sublimate, is added in sufficient quantity to inhibit bacterial or ferment action, the filter will still continue to purify the sewage for several fillings almost as perfectly as before. Soon, it is true, the effluents deteriorate until finally they appear at the outlet unchanged, and differing in no way from crude sewage.

As a result of these and other observations, Dunbar has advanced† the view that purification—or the removal of the putrescible organic matter—is primarily due not to the *direct* action of the bacteria, but to a process of absorption, the continuance of which, however, is dependent on the activity of micro-organisms in the presence of oxygen.

To attempt a precise definition of the term absorption as here used is difficult. Dunbar says: "When we speak of absorptive power and of absorptive activity, it must be understood that a satisfactory scientific explanation of the processes indicated thereby has not yet been found. What we do know is that when certain solutions," *e.g.*, colloid solutions, "are brought into contact with garden earth, animal charcoal or other suitable material a removal or separation of the substance in solution occurs; in other words, a result is obtained which is not to be explained by ordinary chemical or mechanical principles." According to chemico-physical nomenclature the term "*adsorption*" should perhaps be applied to this phenomenon. Lachaud‡ defines "*adsorption*" as "condensation of the substance in solution on the surface of the adsorbing medium by reason of a hypothetical attraction or mechanical affinity existing between the two."

In reference to sewage purification, however, it is perhaps preferable to use the term

* Dunbar & Thumm, Beitrag z. derz. Stande d. Abwasserreinigungsfage, C. IV.

† *l.c.*; also Gesundheits-ingenieur, 1903, Nos. 33, 44.

‡ Comptes rendus 122, 1896, S. 1328.

"absorption," following here the lead of the agricultural chemists, by whom the word has long been applied to those processes by which water is freed from its organic impurities in its passage through soil, and thus indicating by this new application of the term the continuity of principle which exists between the old "irrigation" and the modern "filtration" systems.

Crude domestic sewage is water containing various organic and inorganic substances partly in solution and partly in suspension. When sewage is brought on to a ripe filter a more or less complete elimination of these substances is effected.

The suspended matters are removed mechanically.

Of the dissolved inorganic substances some, such as the chloride, pass through unchanged; others, *e.g.*, sulphuretted hydrogen and possibly ammonia, are retained, probably as the result of a chemical combination with some constituent of the filter. Thus sulphuretted hydrogen is often retained as sulphide of iron. Others again may disappear as the result of direct oxidation by the adsorbed oxygen. The importance of this factor in purification does not appear to be sufficiently recognized. Under laboratory conditions, examples of its activity are furnished by solutions of Dimethylaniline* (colourless) and of calcium hypochlorite,† both of which, when brought into contact with fragments from a ripe filter, are very quickly oxidised, the former to methyl violet—a change which ordinarily requires heat and the addition of some strong oxidising agent—and the latter to chlorate.‡

But it is not as a rule the presence of any inorganic substance which renders the purification of sewage necessary. It is rather the complex putrescible albumenoid matters on the removal of which we lay the chief stress. These are mainly colloidal. Their elimination in the biological filter is the work of a few minutes. It seems, therefore, reasonable to conclude that the force—the primary force effecting their separation and retention—is not a bacterial, but a chemico-physical—absorption.

But the absorptive power of a filter is limited. According to Lachaud, absorption will continue until a condition of equilibrium is established between the colloid in solution and that retained on the absorbing medium. So in a

* Lübbert, quoted by Dunbar, *loc. cit.*

† Dunbar & Korn, Gesundheits-ingenieur, 1904, No. 2.

‡ This fact has suggested the use of chloride of lime as a disinfectant in cases where the sewage is to be subsequently treated by filtration. (Dunbar.)

filter: once this condition of equilibrium is established once the absorptive power is exhausted, no further purification or elimination of colloids can take place. The filter must first undergo regeneration (resting interval).

The factors necessary for regeneration are micro-organisms and an abundant supply of oxygen. Through the agency of the micro-organisms and their enzymes the absorbed matters are broken down and the products then immediately oxidised partly by the direct action of the oxygen (see above) and partly by the action of nitrifying and other bacteria.

By this conversion of the colloidal matters into substances which are either not absorbable at all (*e.g.*, nitrates) or less easily absorbable than the mother-substance a regeneration of the filter is brought about—a disturbance of equilibrium is caused which at the next filling results in the elimination of the products of "mineralisation," and their place being taken by fresh colloid.

From the above it is seen that the "absorption" theory differs from the "bacterial," in that it divides the process of purification into two distinct stages: first, a stage of absorption or of separation and retention of the dissolved impurities; and, secondly, a bacterio-chemical stage of regeneration (resting interval), during which the absorbed matters are broken down and mineralised. Practically, it is impossible to draw a line of demarcation between the two stages. They merge into one another, and in a percolating filter absorption and regeneration may proceed side by side.

It differs, further, in that it postulates the presence of an absorbent. Now, as almost any material* may be used for the making of a filter, it follows that the absorbent is not necessarily something originally present in the filter. It is rather a product of the process of ripening. If a ripe filter be examined, the fragments composing it will be found to be covered with a brownish-black deposit, which, when examined‡ microscopically, is seen to consist largely of "worked over" animal and vegetable *débris*, and when tested with colloid solutions is found to have absorbent powers almost equal to those of animal charcoal. It is no doubt the formation and accumulation of this material—this residue of previously absorbed organic matter—which chiefly constitutes what we know as the process of ripening.

Here lies the weakness as well as the strength

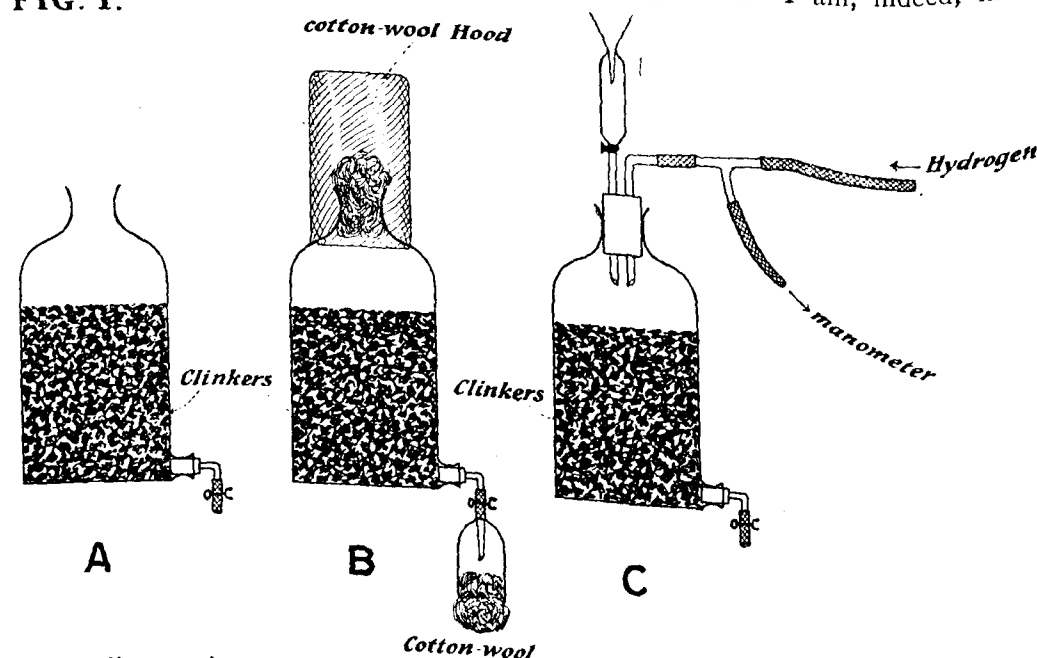
* Clowes and Houston, Treatment of London Sewage, p. 15.

‡ Clowes and Houston.—*l.c.* See also Massachusetts Reports, 1904 and previous years.

of the biological filter, in that the accumulation of this deposit does not cease when a bed is ripe. It continues to form as before, and, though much of it is carried away in the effluent, still it is almost certain that sufficient will remain to cause ultimately blocking of the filter. In practice, of course, other factors influence the rate at which blocking occurs—character of the sewage, durability of the filtering materials, manner of handling the bed, etc. But even with a perfectly sedimented domestic sewage and "ideal" filtering materials with proper management, it is doubtful whether the life of a filter can be regarded as unlimited.

It is well to emphasise the fact,* however, that the deposit which forms in a well-managed filter is very different from the sludge which is

FIG. 1.



formed by sedimentation or by chemical precipitation, and also that it is very small in amount compared with the total mass of organic matter originally removed by the filter.

At present efforts are being directed to the discovery of means by which the excess of deposit can be got rid of easily (*cf.* Dibdin's slate bed).

But a filter such as that referred to above is something very different to what was promised in the early days of biological filtration. The bacteria have not risen to the occasion in the way that was anticipated. As a consequence it is not to be wondered at that some authorities are beginning to view their claims to any share of the work with suspicion. One recent writer†

* Massachusetts Report, 1905, p. 368.

† Bretschneider, Städtische Kläranlagen u. ihre Rückstände. Also Gesundheits-Ing. 1905, nr. 15.

on the subject, basing his conclusions on the character of colloid solutions* as revealed by the ultramicroscope, states that in his opinion the effect produced in a filter is mainly mechanical; in other words, it is nothing more than a separation or removal of suspended matter by mechanical or mechanico-physical filtration, and that the name "biological filter" is a misnomer, micro-organisms having little to do with the process. If any micro-organismal or enzymic action does take place, it is incidental, and is, as a rule, so insignificant that it may be left out of account. He goes on to say: "I am of opinion that as yet sufficient evidence has not been produced to show that oxidation is brought about by the activity of micro-organisms. I am, indeed, much more

inclined to believe that the air alone is sufficient for this purpose, and that the co-operation of micro-organisms is not essential." Practically this amounts to an acceptance of the first part of Dunbar's theory and rejection of the second. The writer maintains that for the continuance of the process of elimination (or absorption) of colloid matters micro-organisms are not necessary.

A short time ago I had an opportunity of carrying out one or two experiments relative to this matter, the results of which I shall now briefly describe. They were made with the object of ascertaining first whether "mechanical filtration" is sufficient to explain the separation of a colloid from solution as it occurs in a biological filter; secondly, whether it is true

* *cf.* Michaelis, Deutsche Med. Wochenschrift, 1904, nr. 42.

that micro-organisms play no part in bringing about this separation, and finally, whether there is any truth in the view that air alone is sufficient to bring about the various oxidation changes that occur ordinarily in a ripe filter.

The experiments were carried out under conditions which rendered possible the control of the different factors.

Glass bottles of about two litres capacity were used—a size convenient for sterilization and supplying an effluent sufficiently large for purposes of examination. The filtering material selected was hard well-burned clinker—1 to 3 m.m. in diameter—washed, dried, and carefully freed from dust. Of the colloids tried, peptone was found to be the most suitable: it dissolves easily; in solution it is practically uninfluenced by any form of mechanical filtration, *e.g.*, it passes through the pores of a Berkefeld filter without undergoing any appreciable change in concentration; it is easily sterilized; and finally, being a fairly advanced product of the hydrolysis of albumen, it may, in its behaviour in the filter bed, be reasonably compared with some of the products of bacterial action found in sewage.

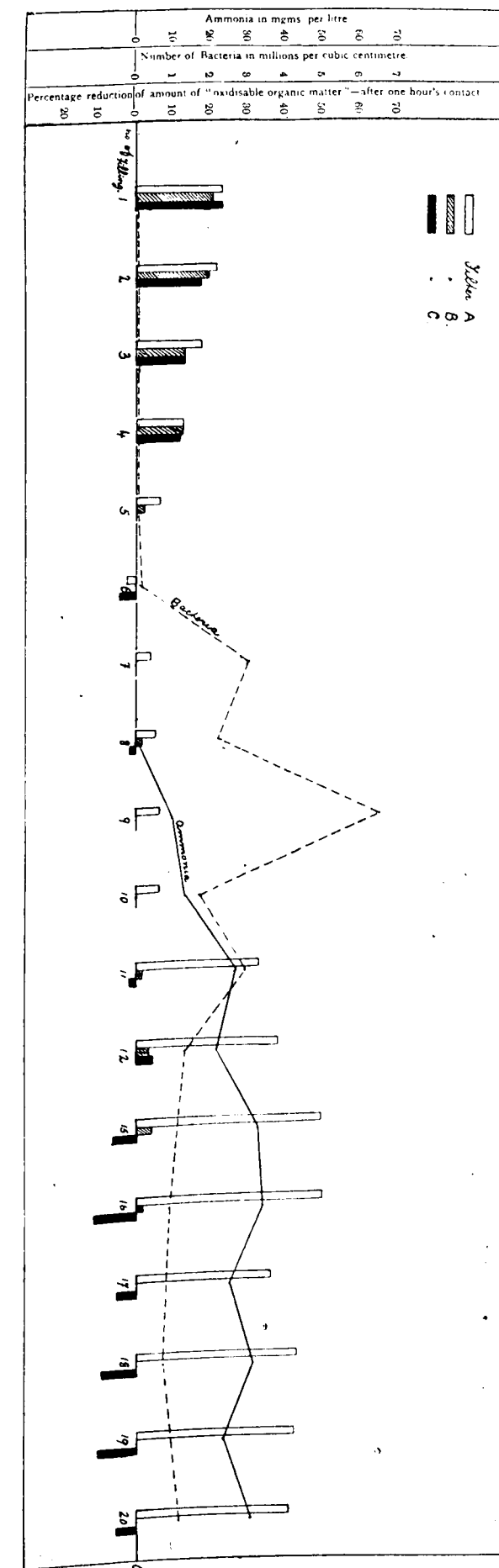
The strength of solution used (0.1 per cent.) was such as to give a constant value of about 750 for the "oxygen absorbed" (Kubel) expressed in mgms. KMnO_4 per litre.

At the commencement of the experiments all three filters were sterilized. Sterile peptone solution was used throughout. The view of the filters (Fig. 1) shows that they were exactly alike. They were also handled in identically the same manner, except that during the resting period the air admitted to B was filtered through cotton wool, while that gaining admission to A was unfiltered. The filter C was supplied with hydrogen gas; it was kept under anaerobic conditions.

The filters were filled every third day—except during an interval of one month between the 12th and 13th fillings—and allowed to stand one day full and two days empty. After the 5th filling the standing-full period was shortened to one hour. Considerable difficulty was experienced in keeping B sterile. The first experiment that was made failed on this account—owing to B becoming accidentally infected. The second attempt, however, succeeded, and at the end of 3½ months the filter and its contents were still quite sterile—gelatine plates inoculated with 1 c.c. of the effluent and with a fragment of the clinker failing to show any growth.

The chief results are given below in tabular form (Table 3), and also diagrammatically (Fig. 2) the vertical columns representing

FIG. 2.



the percentage reduction at each filling of amount of oxidisable organic matter, *i.e.*, peptone and its products effected by one hour's contact in the different filters.

TABLE 3.

Percentage reduction of amount of oxidisable organic matter effected by one hour's contact.

No. of Filling.	A.	B.	C.
1	23	20.8	23
2	21.5	19.6	17.6
3	17.4	13	13
4	12.5	12.5	12.5
5	6.26	2.08	
6	2.08	0	4.17
7	4	0	0
8	5.1	1.7	1.7
9	6.1	0	0
10	6.1	0	0
11	32.7	1.8	1.8
12	37.5	3.13	4.69
15	49	4.1	6.1
16	49.1	1.9	11.3
17	35.6	0	5.08
18	42.3	0	9.6
19	41.6	0	10.4
20	40	0	5.4

From a study of these results it appears that when sterile peptone solution of constant strength is added periodically to a sterile bed of clinker the power of the latter to absorb the peptone gradually diminishes, until finally the peptone flows away in the effluent in the same concentration and in the same unaltered condition in which it was present in the influent. There is established, in short, a condition of equilibrium which can only be disturbed by some change in the condition of the peptone already absorbed. In the case of B filter no change occurred; as a consequence after the initial power of absorption had once been exhausted the effect of the filter on the solution was nil, and remained so, although air was freely admitted in the resting interval during the whole course of the experiment. It therefore follows that air alone is not sufficient either to maintain the eliminating power of the filter or to initiate oxidation changes in the absorbed peptone. For this other help is necessary.

In A, where all the necessary factors were present, we observe a gradual regeneration of the filter and the continued production of a satisfactory effluent. It is true that at first a disappearance of the absorptive power took place, but this was due to the fact that all the filters were sterile at the beginning, and that, though no effort was made to keep A sterile, the number of micro-organisms obtaining access was so small that some time was required

to elapse before sufficient were present to cause any appreciable effect. It will be noted that the recovery of absorptive power is almost coincident with the appearance of bacteria in the effluent. (Table 4 and Fig. 2.)

TABLE 4.

FILTER A.—Samples taken after one hour's contact —

No. of Filling.	No. of Bacteria per c.c. of Effluent (Gelatine 22° C.).	Ammonia. Mgms. per litre.
1	0	0
2	0	0
3	0	0
4	0	0
5	123	0
6	153,200	0
7	3,080,000	Trace.
8	2,210,000	Trace.
9	6,530,000	9.9
10	1,720,000	13
11	2,920,000	26
12	1,340,000	21.2
15	—	32
16	950,000	33.2
17	—	24.4
18	720,000	30.8
19	—	23
20	1,130,000	30

The sharp rise and fall in the bacterial curve seem to point to a process of selection having been at work in the early stages of the life of the filter.

The ammonia curve is also interesting.

To make my conception of the process of purification clearer, I venture an example (see Diagram A).

Let us take a filter—two of the fragments of which are represented in the diagram (Diagram A)—with a total air capacity of 1,000 c.c. and a water capacity of 200 c.c. We flood this (dry) filter with 1,000 c.c. of a 0.1 per cent. peptone solution, and we obtain 800 c.c. effluent, showing a reduction in concentration of, say, 20 per cent.—*i.e.*, there are retained in the filter 200 c.c. water and 0.36 gm. peptone; in other words, while the concentration of the effluent is 0.08 per cent., that of the "solution" round the fragments of the filter is 0.18 per cent. If at our next filling we used 0.08 per cent. solution no further absorption would take place. Instead of this we again use 0.1 per cent. solution, and again absorption occurs, and this continues with each filling until finally a condition of equilibrium is established between the peptone in the influent and that already absorbed or deposited in the filter.

With a sterile filter deposition ceases here, which would not be the case if the process were

what is ordinarily understood by the word "mechanical,"* or if it were independent of the action of micro-organisms.

Through the action of micro-organisms and their ferments in the presence of oxygen a breaking down or partial mineralisation of the

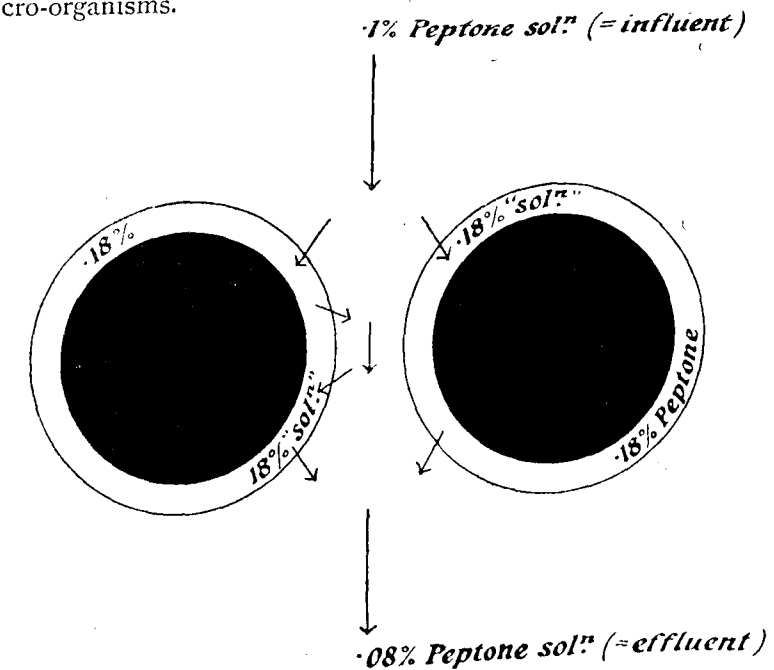


DIAGRAM A

Diagram B shows the second stage, the stage of regeneration:—

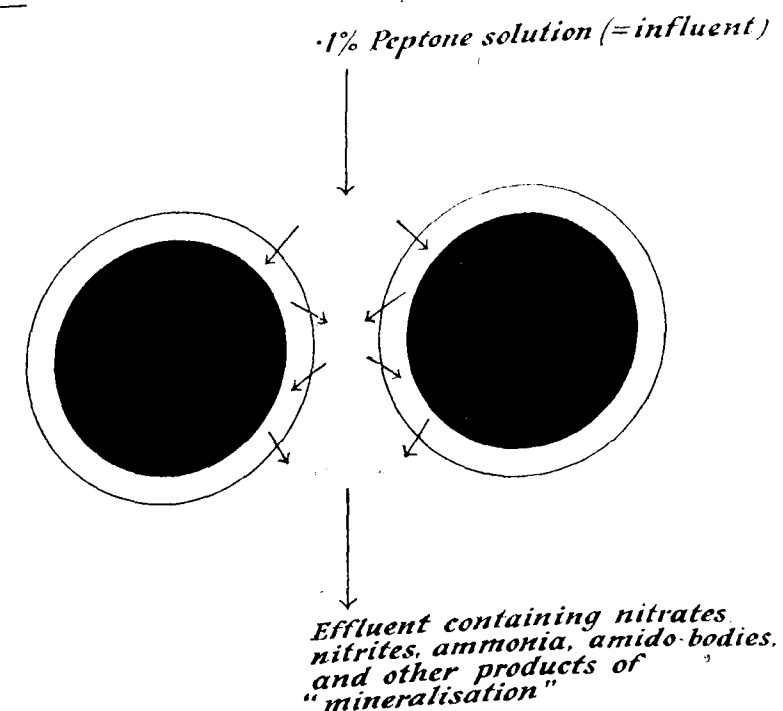


DIAGRAM B

peptone occurs. The bodies so formed differ in their properties from the original colloid.

* In this connection cf. an interesting paper by Jones and Travis, "Elimination of Suspended Solids and Colloids from Sewage" (Proc. of Inst. of Civil Eng., 1905-6, Paper 3,599), where the bacterial factor, however, does not seem to be given due prominence.

They are simpler, and are either not absorbable at all or less easily absorbable than the mother-substance. By their formation we get a

disturbance of equilibrium, which at the next filling results in fresh peptone being absorbed while the nitrates, ammonia, amido-bodies, etc., are eliminated.

The results obtained with Filter C, which was in effect a kind of septic tank, were only such as were to be expected. They show that without oxygen no satisfactory regeneration is possible. The apparent increase in the amount of "oxidisable organic matter" is due partly to the presence of reduced salts of iron (derived from the clinker) which interfered with the test, and partly to the fact that the products of the anaerobic fermentation of albumen and of peptone often show a higher value for the oxygen absorbed than the mother-substance.

To sum up the main points of my thesis:—

1. A biological filter eliminates from sewage dissolved putrescible substances almost immediately.
2. This elimination does not *directly* depend on the presence of micro-organisms.
3. As the substances in question are almost all colloidal it is highly probable that the force at work effecting their elimination is absorption.
4. But absorption does not go on indefinitely. To ensure its continuance a change—"mineralisation"—must take place in the absorbed matters.
5. To initiate this change oxygen alone is not sufficient; we require in addition the active presence of micro-organisms (and their ferments).
6. On the other hand, micro-organisms alone are also insufficient, although through them no doubt a partial "mineralisation" does occur. The products of this mineralisation, however, are quite as objectionable as the mother-substances, as evil smelling, and with as great an affinity for oxygen, so that an effluent containing them can no more be considered pure than the original untreated influent.

TOOTH-BRUSH DRILL IN SCHOOL.—The regular use of the tooth-brush is practically unknown, and the parents do not appreciate the seriousness of neglecting to keep their children's mouths clean and free from decay. It is useless to preach to parents or children on this matter. The lesson must be driven home by the practical enforcement of tooth-cleaning at the school. The daily practice of this just before the commencement of the afternoon session would alone result in a great improvement in the general health.—*Annual Report of Dr. R. Ashleigh Glegg, Medical Officer of Health, Lindsey County Council.*

SOME DIFFICULTIES IN THE CONTROL OF THE MILK SUPPLY.*

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THE subject I am venturing to address you upon this afternoon is by no means a new one, nor are my remarks likely to include any very novel or original points, but, nevertheless, the matter is one of the highest importance at the present time, and of the very greatest interest to us as sanitarians. Much has been done of late years to educate the public in the ways of healthy living, and much good has resulted; but the process is a slow one, and sometimes a very thankless one, and there are still many directions in which little progress has been made. The milk supply is a striking case in point, for in spite of the great advance in our acquaintanceship with the conditions which affect this almost indispensable commodity, both in its production and in its distribution, and also in our knowledge of the means by which its purity and wholesomeness may be safeguarded, so formidable are the obstacles raised by conservatism, prejudice, ignorance and self-interest, that progress and improvement have been retarded to such an extent as often to nullify the effects of our efforts.

Many local authorities have shown themselves acutely conscious of present defects, and have been for some time actively engaged in endeavouring to remedy them. But unfortunately this activity is confined to certain local centres, principally the larger towns, while the lesser towns and rural districts for the most part continue to maintain an attitude of apathy or even obstruction. So long as this state of affairs exists, individual effort on the part of isolated authorities is of little use to the nation generally, and of not much more to themselves. Little assistance has hitherto been obtained from the Government. Laws, regulations, orders, powers to make bye-laws, and so forth certainly exist, but they are incomplete, fragmentary and indefinite. Further, no disposition has been shown by the central authority to compel local councils to make use, and carry out the terms, of the various enactments; in the parliamentary return of 1907, showing the districts in which regulations under the Dairies, Cowsheds and Milkshops Order, 1885, had been made, it appeared that 12 per cent. of

* Paper read before the Northern Branch of the Society of Medical Officers of Health on April 23rd, 1909.

boroughs, 18 per cent. of urban districts other than boroughs, and 33 per cent. of rural districts had none such. That is to say, in the districts in which the milk supply is principally produced there was the least attempt at supervision. Where the vested interest was greatest there the individual was considered before the community. In what proportion of agricultural districts in which regulations have been made are those regulations enforced? So long as the Local Government Board maintains its present lax policy in regard to the duties of local authorities, there is little hope that much good will accrue from the law. Before considering our powers and their limitations, let us first review the conditions affecting the milk supply which call for the exercise of supervision and interference.

These conditions may be grouped roughly under two main heads, according to the methods by which they are discovered, viz.:—

(A) CHEMICAL, including all adulterations, deliberate or unintentional, which are revealed by the analyst; and

(B) BACTERIOLOGICAL, including all germ contaminations, which, though unintentional on the part of those responsible, are usually the result of culpable carelessness.

(A) Under the first head (Chemical) we most frequently meet with

(1) *Poverty of the Milk.*—This may be brought about by a number of causes, varying from the old crude adulteration of the milk with water, or abstraction of cream, through various degrees of scientific manipulation. These latter include dilution of genuine milk with skim milk, or worse still, with separated milk; in such cases there may be an attempt to substitute a cheaper fat for the cream, though I have not myself met with this; and in the simple watering of the milk there may even be addition of milk sugar as well, so that there is, on analysis, no apparent diminution of the proportion of solids, not fat. But the most up-to-date mode of artificially augmenting a milk yield is by feeding the cows scientifically, on such cheap belly-filling material as brewers' draff and turnips, or by mixing salt with the food to cause thirst and consequent free drinking of water. Again, if a farmer desires to fatten his beasts for the butcher he usually increases the feed considerably; this also has the effect of increasing the quantity of the milk at the expense of the quality.

The "scientific" method we find practised principally by members of the better or more well-to-do class of farmers, and the cruder

methods by the smaller dealers. As the former are much better informed than the latter, and plead "natural causes," it is extremely difficult to obtain a conviction against them, whereas the small trader receives much less indulgence. A recent morning's work, including three cases in the Newcastle police court, gave a good illustration of this. A farmer in a large way of business, whose farm is advertised widely as a "prize dairy farm," was summoned for selling milk below standard. No actual adulteration could be proved, although it was shown that the milk habitually contained considerably less butter fat than the average obtained by the City Analyst from all samples examined throughout the corresponding month of three previous years (2.7 and 2.5 per cent. as against 3.45 per cent.). An independent analyst gave evidence of having personally taken samples of mixed milk from the byres during milking-time, and having found a similar analytical result to that obtained by the City Analyst. Much evidence was also given to show that a high standard of cleanliness was maintained at the farm—this being quite beside the point—but it also appeared that the cows were fed on a very generous diet, which included a small amount of brewers' grains. Although this man's milk was so much poorer than other people's than it ought to be, and no satisfactory reason other than overfeeding for that state of affairs was forthcoming, the magistrates dismissed the case. This is a type of case which is becoming exceedingly common, the main feature being that the court is flooded with evidence on the part of large numbers of employes of the defendant, to prove that the poverty of the milk is due to natural causes, and not to tampering.

The next two cases were against small dealers who emphatically denied adulteration, but had not a swarm of workpeople to swear to this. They were each fined 10s. and costs.

But the annoying thing was that though the last two cases were duly detailed in the newspapers, there was no mention whatever made of the first, so that the prosecution absolutely went for nothing, whereas the mere publication of the facts would have had a salutary effect.

That there are genuine natural variations in the quality of the milk cannot be denied. Thus morning milk is poorer than that obtained in the evening; "foremilk" is much below average, and the "strippings" are by far the richest part of the yield. Indeed, it is a well-known fact that the head byre-man, one of whose

duties it often is to go round all the cows after the other milkers and draw off the last of the milk, does not always add these "strippings" to the rest of the milk, which thus contains less cream than it ought to. Another point about the "strippings" is that in tuberculosis they are richest in tubercle bacilli. Cold and inclement weather also affect the quality of the milk to some extent, and in the spring months, February to May, when the cows are first turned out, and about calving time, the general tendency is for the quality to be rather lower than usual. But I am quite certain that only a comparatively small proportion of the milks found to be below standard are due to genuine natural conditions.

Another important factor in the question is the breed of cows used. We all know that if we want to keep fowls we must first decide whether we require them principally for laying eggs or as table birds, because the good layers are not generally the best for roasting. So with cows: if a man wants to make his profit from milk he must not stock his byres with beef cattle; the best milking classes, such as the Alderneys, Kerrys and Dexters, are too small and skinny to be popular with the butchers. Even the Ayrshires, though excellent milkers, are rather small for the butcher. If a beast is allowed to become fat, the quality of the milk falls at once.

That the price paid for an animal bears little relation to its suitability for the dairyman was well shown in a list recently furnished to me by the manager of one of the largest dairies in the north of England. In consequence of the average analysis results of his milk being rather low, one of the farmers supplying the large dairy was advised to invest in two really good animals, in order to improve the general yield. He paid £24 for each, as against £16 for his two best milkers; the former gave milk containing 2.57 per cent. and 2.32 per cent. of butter fat, whereas the milk of the latter showed 4.61 per cent. and 4.08 per cent. respectively.

2. Next in frequency, under the first head, we have *Adulteration of Milk with Preservatives*.

Of these the various preparations of boron are the commonest, and although it is still somewhat under dispute whether the assimilation of small doses of these actually does harm to healthy adults, it is generally agreed that they are dangerous and injurious to young people and invalids.

Formalin is also used to some extent. That it acts as an irritant poison was well borne out

by the now classic outbreak of an epidemic skin disease at the Central London Sick Asylum at Hendon, in the summer and autumn of 1903. Some 66 cases were attacked, and there was great difficulty in determining the cause; then it was noticed that the milk, which was the only article of diet which all the victims had consumed, had kept remarkably well for days without souring, and this led to the discovery that the milk contained a large quantity of formalin. Cases are also on record in which formalin has acted as a renal irritant.

Salicylic acid also is said to be used, and bicarbonate of soda, the latter probably to disguise the acidity of fermentation. I have not myself happened upon instances of the use of either of these, however.

3. *Colouring materials*, mostly of a harmless nature, are also used to a slight extent. The commonest are annatto and carotin, but coal tar dyes are sometimes found, and these, according to Newsholme, should be considered an adulteration, as they are sometimes poisonous of themselves, and sometimes by contamination with metallic poisons during manufacture. What is sold as annatto occasionally contains poisonous coal tar dyes.

Artificial colouring is generally used to disguise the fraudulent abstraction of butter fat.

(B.) Under the second head (Germ Contamination) we have to deal with:

1. *Germs of specific epidemic diseases*, such as enteric fever, cholera, diphtheria, and scarlet fever; and anthrax has also been described as being transmitted by milk.

The contaminations may occur directly from workers at the dairies by "carrier" or acute cases, as in the outbreaks of enteric fever recently described by Davies in Bristol, Sir Charles Cameron in Dublin, and Harrington in Massachusetts; the outbreak of diphtheria reported by Armstrong in Sydney; and those of scarlet fever described by Garrett in Cheltenham—to name only a few of those which occurred last year.

Or the infection of milk may take place incidentally during its transmission to the middleman and customer, or during storage by the customer.

2. *Organisms associated with dirt*. These act chiefly on the intestine directly, causing such conditions as zymotic enteritis or summer diarrhoea.

For some years past in Newcastle samples of milk have been regularly examined for these

organisms, and the results have been very striking. During 1907, for instance, 37 per cent. of samples were classed by the bacteriologist as unsatisfactory; while in 1908 there was a drop to 25 per cent, which, though not a figure to boast about, at any rate shows an improvement which is extremely encouraging. Of the samples taken from dairies, farms and carts 22 per cent. were unsatisfactory. Of those from general dealers' shops 43 per cent. were unsatisfactory, and of those from cafés, tea rooms and restaurants 53 per cent. were unsatisfactory. I might mention that the standard set is not a high one—a milk being classed as satisfactory if bacillus coli is not found in a smaller volume than 0.01 cc., and bacillus enteritidis sporogenes in not less than 10 cc. of milk.

This particular organismal contamination has been shown by the very complete report of the investigation of Dr. Thos. Orr, for the various Yorkshire authorities which united for the purpose in 1906, to occur principally at the cowshed, and to be almost entirely preventable, while the propagation of the germs introduced into the milk can be largely prevented by efficient cooling. So much has been written recently on this part of the subject that it is quite unnecessary for me to particularise further.

3. *The bacillus of tuberculosis*.—This is by far the most serious of all the contaminations. Great advances have been made by the "powers that be" since January last, for by the issue of the third interim report of the Royal Commission on Human and Animal Tuberculosis, they have at last admitted what everybody else who knew anything about the question was satisfied of long ago: that it was not necessary for a cow to have tuberculosis of the udder, visible either ante or post mortem (which after all, indeed, is relatively rare) before it could give tuberculous milk.

During the past two years only some 5 per cent. of the milks sampled in Newcastle were found to be tuberculous. But already during the present year, out of 39 samples examined 9, or 23 per cent., have been found to be tuberculous.

Now, what can we do under all these various circumstances?

From the very outset we are hampered by the lack of uniformity in the action taken by the various local authorities. An active authority begins to put the screw on, others remain apathetic, and the result is that in case of prosecution the magistrates are disinclined to

support views which are not favoured by their neighbours in other districts; so, what is the use of prosecuting, especially where the culprit manages to have all mention of his case by the newspapers suppressed, and so avoid the notoriety and consequent loss which the publication of the facts of the case would inevitably cause?

Let us now rapidly consider our powers under each of the above headings.

(A.) 1. *Poverty of the Milk*.—Here action is taken under the Food and Drugs Acts. The instructions in the Acts must be very carefully followed in taking samples and so forth, as any slight divergence from the prescribed formalities may cause a good case to be lost on a pure technicality.

The charge is made under section 6 of the Food and Drugs Act, and under clauses 1 and 2 of the Sale of Milk Regulations, 1901.

The main difficulty, as indicated above, is that as under certain conditions cows do produce milk of a lower fat-standard than that fixed in the regulations, the magistrates do not "presume" (to quote the clause) "that the milk is not genuine," because they usually consider that "the contrary is proved," by the evidence given that the milk has not been tampered with, and this evidence is not always very conclusive.

It has been held in some courts that deliberately feeding cows on a diet calculated to increase the quantity at the expense of the quality of the milk constitutes tampering or adulteration.

The question of "warranty" is another great stumbling-block in the way of getting a conviction; the person who gives the warranty may be, through distance or other circumstances, quite un-get-at-able, and, speaking generally, a smart lawyer can always work out the necessary chain of evidence to complete the defence under section 25 of the S.F.D.A.

2 and 3. *Preservatives and Colouring Materials*.—Action on this head would also be taken under section 6 of the Sale of Food and Drugs Act, the milk not being of the nature, substance, and quality demanded. Action ought really to be taken under sections 3 and 4, but the defence provided by section 5—the necessity of proving "guilty knowledge"—makes these practically inoperative. But under subsection 1 of the same section no offence is committed whether "any matter or ingredient not injurious to health" has been added to the food or drug, because

it is required for the production or preparation thereof, as an article of commerce in a state fit for carriage or consumption, and not fraudulently to increase the bulk, weight," etc.

Therefore it falls to the prosecution to prove that the added ingredient is injurious to health, a by no means easy matter in the case of boron compounds, for example. Consequently action is rarely taken nowadays for addition of boric acid, which is by far the most frequently used preservative.

In a case recently reported a conviction was obtained on three arguments: first, that the use of boric acid was injurious; second, that no notice of the fact that the milk (and also cream, in another case) contained boric acid was given to the purchaser as required by section 8 of the Food and Drugs Act; and thirdly, that preservatives were only used in order that stale commodities might be sold as fresh. In this case the milk contained 2½ gr. of boric acid to the pint.

I need hardly remind you that the recommendation of the Departmental Committee on Preservatives and Colouring Matters in Foods that the use of any such in milk be constituted as an offence under the sale of Food and Drugs Act, has, like many other recommendations of special committees and commissions, remained a dead letter.

(B.) CONTAMINATIONS.—I. *Conveyance of the infection of the specific epidemic diseases by milk.*—Here the powers are only fairly satisfactory, and the exercise of considerable vigilance is necessary in the use of them. These powers are obtained under section 4 of the Infectious Diseases Prevention Act 1890, which is only adoptive, however, and under the Dairies, Cowsheds, and Milkshops Orders of the L.G.B. The former permits an M.O.H. to inspect dairies within his district, or, under a justice's order, without his district, when he has reason to suspect the milk from any such to be causing, or likely to cause, infectious disease in his district. The sale of the milk can then, if necessary, be stopped, but time is lost through the M.O.H. having to go to his local authority. Furthermore, the latter can only stop the sale of the milk in their own district.

Under the Cowsheds, Dairies, and Milkshops Order, section 9, to permit the contamination of milk by an infected worker is forbidden. Under section 13 a local authority may make bye-laws for, among other matters, prescribing precautions to be taken by dealers against such contamination. But the limitations of our

powers were well shown recently in the enteric outbreak in Dublin, due to a carrier case among the milkers on a certain farm, when, although Sir Charles Cameron was satisfied of the causative part played by the milk, the Corporation's legal advisers held that in the existing state of the law no legal action could be taken, and that therefore the sale of the milk could not be interfered with.

Under Part IV. of the P.H.A. (Amendment) Act, 1907, the powers in respect to infectious diseases in connection with the milk supply have been considerably amplified, dairymen being now required, if requested, to furnish lists of the source of their supplies, and to notify cases of infectious disease occurring among their servants. This Act is also only adoptive.

2. *Organisms associated with dirt.*—Comparatively few authorities have taken up this branch of observation, and, so far as I can find, no prosecutions have taken place under this head. Should it be necessary to take legal action, section 117 of the P.H. Act 1875 would appear to apply—a polluted milk being an unsound article and unfit for human food. Or if uncleanness in the cowshed or dairy could be shown action might be taken under the bye-laws.

3. *Tuberculosis.*—This is perhaps the most difficult question of all to deal with. Under the present circumstances our procedure is lengthy, somewhat uncertain, and frequently leads to nothing. The tuberculin test, which is an extremely delicate and accurate one, is the means of exposing such a vast proportion of tuberculous cattle that farmers will never submit to its application to their herds if they can help it. As we have no power to enforce its use, we can only fall back upon the extremely cumbersome (because long) process of inoculating guinea-pigs with the mixed milk of a farm. Fortunately for us in Newcastle, the big companies never mix the supplies from different farms, and also they keep a careful account of the final destination of each farm's milk, so that it is possible to find at once from what farm any customer was supplied. If the guinea-pig does not die of some other bacterial infection, e.g., streptococcal, meanwhile, it is killed in a month and examined for evidence of tuberculosis. If the disease be found we are very little further on than we were before. If the farm be within our own district, the veterinary officer of the Corporation visits and

inspects the cattle. If udder disease be found in any of the animals the sale of their milk is stopped; the farmer may or may not have the animals slaughtered. If he does not, but merely sells them to some one else, how much better off are we? There is nothing to prevent their going into a district where inspection is more lax, and being used still for dairy purposes. If the tuberculous milk be from a farm outside the Corporation area, all that can be done is to communicate with the M.O.H. for that district. He may, or may not, contrive to persuade the farmer to get his cows examined by a veterinary surgeon, and animals with tuberculous udders eliminated from the herd; but even if he does manage so much, what becomes of the animals?

If tuberculosis were only a statutory infectious disease under section 6 of the Infectious Diseases Notification Act, then section 4 of the Prevention Act would apply both as regards inspection of the dairies and cowsheds, and stoppage of the sale of the milk. Unfortunately the recent regulations as to tuberculosis do not constitute tuberculosis one of the infectious diseases, and what Mr. John Burns' Milk Bill is going to do remains to be seen.

Such is, roughly, a sketch of the principal difficulties encountered by the medical officer of health in his endeavour to improve and safeguard the standard of the milk supply of his district. And the greatest difficulty of all is just this: that such means as are to hand for the purpose are designed, not for the nation generally and equally, but for the individual districts; as it depends absolutely upon the constitution and interests (sometimes purely personal) of the local authority to what degree the law, such as it is, is carried out, it follows that there is very great variation in procedure in different localities, which goes far to nullify any general effects which might otherwise accrue.

Again, there is no such encouragement to the trade to make improvements as is recommended by a conference under the auspices of the United States Department of Agriculture (circular 114). In this circular the strong approval of the conference is given to the system of "certifying" milk supplies as the result of regular, frequent, and careful inspection, the purveyor receiving a better price for "certified" than for uncertified milk. At present it pays a dealer to do as little as possible in the way of improvement.

As regards tuberculosis, some system of

national application and central administration is urgently required. The Danish procedure (or Bang system), already tried by some large owners in this country, appears to be a good one and not too drastic. It consists in the slaughtering of all animals showing visible signs of tuberculosis, with compensation to the owners, and the isolation of reactors to the tuberculin test from non-reactors; the latter includes the immediate separation from reactors of their calves. By this means it is claimed that the gradual elimination of tuberculosis is quite feasible. Failing some such national scheme as this it will be necessary for individual authorities to endeavour to obtain such useful milk clauses as are possessed by the Corporations of Sunderland, Liverpool, Sheffield, Manchester, Birmingham, etc.

Under a local act in Newcastle it is forbidden under penalty to sell the milk of a cow known to be tuberculous, and makes it compulsory to notify the occurrence of tuberculosis in a herd. But as "guilty knowledge" must first be proved—an impossibility—these clauses are quite useless.

Much more might be said upon this subject, and I have not attempted to do more than summarise the difficulties we commonly meet with. The suggestions for overcoming them are legion, and as I am sure that I have tried your patience severely enough already, I shall spare you any further details than I have already mentioned. Before sitting down I should like to express my indebtedness to Dr. Henry E. Armstrong for much information obtained from him on this, a favourite subject of his also, during my tenure of office in this Department, and for permission to make use of the office records.

THE SCARCITY OF MILK IN COUNTRY DISTRICTS.—There is more difficulty in procuring milk in these country villages than many people would imagine, and if legislation is made too stringent I am afraid the supply would tend to be smaller than it is now. I find so many people only allow their neighbours to have milk as a favour, and if drastic alterations are ordered to be made, they would give up selling milk altogether and use all they have for the rearing of calves and pigs to the detriment of the babies of the village. By persuasion and education we must hope to greatly improve the dwellings of the cows and the cleanliness of the milk vessels, and thus lead to the provision of a pure supply of milk in this neighbourhood."—*Annual Report of Dr. R. Ashleigh Glegg, Medical Officer of Health, Lindsey County Council.*

A PURE MILK SUPPLY.*

By J. ALBERT GIBSON, M.D., D.P.H.,
Medical Officer of Health, Isle of Wight Rural District.

THE subject of a pure milk supply is one which is of interest alike to urban and to rural medical officers of health, and the resolution referred to this branch by the parent society as to the formation of a service of veterinary inspectors and as to the desirability that cowsheds should be brought up to a reasonable standard under a uniform code of regulations formulated by a Government authority appears to me to be one on which we ought to express ourselves very strongly. The subject is one which has attracted so much attention of recent years that the public will demand some improvements at an early date.

In this district, which is a rural one, we have over 250 registered milk sellers supplying milk not only in this district but largely to the two boroughs and the six urban districts which make up the rest of the Island. As the appointment of veterinary inspectors would have been a very serious expense to our small rateable value, I advised my council that they should ask representatives of the other public bodies in the Island to meet them with a view to discussing the question of appointing veterinary inspectors for districts which would contain both urban and rural ratepayers, at the same time pointing out to them that it was essential to take some steps to keep cows in a healthy condition. This meeting took place some time ago, and a committee was formed consisting of the chairman or other member of each council to bring forward definite recommendations as regards the appointments and districts.

Since then the Board of Agriculture has issued an order making the examination by veterinary inspectors of all bovine animals suspected of being tuberculous by county and borough councils compulsory after January 1st, 1910.

The committee has therefore decided to leave the matter in abeyance until the order has been considered by the County Council. But the meeting has already borne fruit: considerable interest has been aroused among the farmers, and several farmers have called in veterinary surgeons to inspect their cows and test them with tuberculin, the certificates issued by the veterinary surgeon being printed and circulated in the district in which the milk is delivered.

*A paper read before the Southern Branch of the Society of Medical Officers of Health at Ryde, June 25th, 1909.

My inspectors are now endeavouring to obtain copies of these certificates to show to milk sellers in other parts of the Island with the object of inducing a spirit of healthy rivalry among them.

There can be no doubt that this order of the Board of Agriculture is one on which the country is to be congratulated, as we shall next year have all cows, both rural and urban, being examined and destroyed if found or suspected to be tubercular. Definite sums of compensation will be payable by the County Council, the amount of such compensation being dependent on the amount of tuberculosis which is proved to exist. In the new Milk Bill now being promoted by Mr. Burns, the Local Government Board may, by order, require the council of any county, borough or urban district to appoint one or more veterinary inspectors.

This order seems to imply that a regular service of veterinary inspectors is desirable, and seems to dispose of the resolution referred to us, in so far as the formation of such a service is concerned, as this will be dealt with under the new Milk Bill.

As regards the other part of the resolution, that it is desirable that cowsheds should be brought up to a reasonable standard under a uniform code of regulations, this is a matter which will come more directly under the jurisdiction of the medical officer of health.

I should like here to explain what has happened in this district.

When I arrived here two years ago I found almost all the cowsheds in the district in a very neglected condition.

The model bye-laws of the Local Government Board had been adopted by the Council in the year 1900, but had certainly never been put in force.

Only a very limited number of the milk-sellers were registered, they were very rarely visited, the cowsheds were in a filthy condition, badly lit, badly ventilated, badly drained, the walls and ceiling covered with cobwebs, and limewashing very rarely done, if at all.

The cubic space was in nearly every instance very inadequate. With the aid of my inspectors I have made a fierce onslaught on these, and there is now a considerable improvement, but much remains yet to be done. The residents do not approve of changes, but I have met with wonderfully little opposition from the farmers, although they all appeared very much surprised at being interfered with at all, as they had never been so visited before.

In the matter of limewashing and cleansing I have not found very much difficulty, except due to the forgetfulness of the farmers; and some time ago I instituted a system whereby each of my inspectors issues a postcard to each of the registered milk-sellers in his district twice yearly to remind him that limewashing is due. These are sent out twice yearly, namely, about the end of April and the end of September.

Some difficulty has arisen as regards the interior of the roof, as there is a slight reluctance to do that. Even in some of the cleanest cowsheds, in which the walls had been regularly cleansed and limewashed, the ceiling had never been done. The greatest difficulty has arisen in the case of thatched roofs, and I am insisting in every case that some material must be placed below the thatch which will retain limewash, or else the roof must be renewed.

As boarding is rather an expensive matter, I made some inquiries as to something less expensive, and found a material (called Anderson's stoniflex roofing felt) which is much cheaper than boarding, and has been used in several instances here.

LIGHTING.

The light was in the majority of cases markedly deficient, and it was often difficult going in out of the sunlight to see anything for a few minutes.

Windows were as a rule spaces without glass, and they had been boarded up and covered with old sacks to keep the cold out; and many of the older sheds do not come up to my ideal of light yet, but could not be altered without entire reconstruction.

In a large number of cases, however, we have succeeded in getting windows added in sufficient number to give reasonable light.

VENTILATION.

The ventilation was generally more effective, due to numerous holes and defects in the structure, but we have succeeded in the case of all new cowsheds in getting proper ventilators, generally consisting of a curved pipe with the curve inside turning up towards the roof, thereby preventing any direct draught to the cows.

In the case of old sheds we have generally managed to get them to provide some means of better ventilation, by having openings high up at each end of the shed in place of holes blowing draughts right on to some part of a cow.

WATER SUPPLY.

The water supply is in a rural district often a very difficult question to settle, and we have

sometimes to be content with a rain-water supply, owing to the enormous expense which a fresh supply would involve, but we have in several instances got water laid on from mains some distance off, and in some instances even wells have been sunk.

Considerable difficulty has been experienced in persuading farmers not to allow their cows to drink from ponds into which the sewage of the farmyard, and probably of the house also, discharges.

When I find a pond of doubtful quality I am generally told that the cows do not drink from it, or that cows are not allowed to graze in that particular field. In one case I was foolish enough to believe the statement. A few days later as I passed the farm I saw the cows in the pond and drinking freely from it.

After that the committee insisted upon the pond being railed off to prevent the cows having access to it.

DRAINAGE.

The drainage of the cowshed and the yard is a matter of considerable importance.

We found many of the cowsheds here with no floor and the drainage all finding its way to the yard, there to find its way again to the pond from which the cows were drinking. In many cases an impermeable floor was provided, but the inlet to the drain was inside the cowshed, while very few had any system of drainage provided.

In all cases we have insisted upon the drain inlet being placed outside the cowshed, we have succeeded in getting most of the floors of an impermeable nature, and in a large number of cases we are managing to get them to provide a septic system of drainage.

The reason I have advised a septic system is on account of the fact that it takes up less room than most of the other systems, and a cesspit is seldom large enough to take the great amount of drainage which comes from a farm yard.

We insist upon the yard being kept clean, as heaps of manure left about form a breeding place for flies, which carry infection to the milk before its removal from the cowshed, and where the dairy is not properly protected by gauze they also affect the milk in the dairy.

DAIRIES.

As regards the dairies, they were generally in a much better condition than the cowsheds, cleaning, lighting, ventilation and drainage being mostly carried out well. The opinion appears to have been that so long as the dairy is kept clean and tidy it does not in the least

matter what state the cowshed is kept in. In a certain number of cases we found dairies being used as general stores, and we have taken considerable trouble to explain to owners the danger of keeping meat and vegetables and even money in a dairy, and the need for having open windows to let in air, at the same time screening them to keep out flies.

The matter of cleaning the udders of the cows and the milkman's hands is, of course, a very difficult one to watch. Pails of clean water are always in evidence just before milking and if an inspector is present the water is used, but one wonders whether it is always used when an inspector is not present.

I may mention here that we have not had to resort to prosecution in a single case as yet, though we have been very near it in several cases, but I have always pointed out to those who have been threatened with it that the matter would then appear in the papers, and it would not, to say the least of it, do a dairy any good.

We have succeeded in getting a considerable number of new sheds erected, and have insisted upon plans being submitted. Whenever we hear of anyone starting the trade of milk-seller we send a postcard calling attention to the provisions of the Dairies, Cowsheds and Milkshops Order.

I am sorry to say that we still have a number of cases which will not be really satisfactory until new sheds are erected, but we have to go cautiously in a rural district.

I think that the need of a pure milk supply is admitted by all: how it is to be achieved is another matter. I know that many medical officers of health are in favour of having all milk sterilized, but I should like to emphatically dissent from this method of supplying the public with pure milk.

Whether or not sterilized milk is deprived of some of its nutriment is at present, I think, a disputed point, but I hold that it is the duty of a public body who are responsible for the public health to safeguard a food of such vital importance to children, so that it can be used in its natural condition without risk of infection.

The first danger to which milk is exposed is from the hands of the milkman. Strict rules should be laid down and embodied in regulations that every milker should wash his hands in clean water before proceeding to milk a cow, and should wear a clean apron or smock.

The next danger is from unclean udders. Cows lie down in dirty yards and dirty

cowsheds from which the manure has not been removed, and the udders become covered with manure and other dirt which is then carried into the milk in the process of milking. The dirt is not only harmful in itself, but also from the fact that it may contain bacilli of various kinds.

It should be compulsory, under penalty, to remove all dung and other offensive matter and sweep down the shed twice a day.

This would necessitate constant inspection, and in districts where large numbers of cowsheds exist this would necessarily take up a considerable amount of the inspector's time.

And while I am on the subject of penalties I should like to urge the necessity of an annual licence being compulsory, and that the milkman with his cart should be subject to the same penalty as the motorist who is unable to show his licence to the policeman—the sanitary inspector having the right to demand it as to any milk cart in his district.

My inspectors have instructions to ask the driver of any milk cart which they see delivering milk in the district if he is registered. It is true that we cannot demand this at present, but by the time the driver has stopped to listen to the inspector it is an easy matter to read the name, which is noted, and the register can then be investigated to see if his name occurs in it. I may mention that we have discovered several unregistered ones in this way.

The next danger is from a dirty shed: dust and dirt allowed to accumulate on the walls and ceiling is blown into the milk. The sheds should be light and well-ventilated, cleansed regularly every day and flushed down, while limewashing of both the interior of the roof and the walls should be done at least twice a year, though I should like to see it done oftener. In cases where any disease of the cattle has been ascertained, limewashing should be carried out as soon as the animal has been removed.

Then the pail into which the milk is received should be thoroughly cleaned with boiling water before being used, the same applying to the milk cans and measures.

When a dairy is kept the same scrupulous cleanliness should be observed, and the dairy should be light, cool, well-ventilated, and protected by gauze from flies, which are a fertile cause of infection. I do not think that the danger from flies is fully recognized: they have free access to manure heaps, into bedrooms where infectious disease exists, and generally to wherever decay is going on. The presence of flies

sans the presence of decaying matter. They are capable of carrying enormous numbers of bacteria.

The multiplication of bacteria in milk depends on the temperature at which the milk is kept. The higher the temperature the more rapid the multiplication and *vice versa*, and it is therefore highly desirable that milk should be kept as cool as possible from the time of milking.

I trust that a uniform code of regulations may be drawn up embodying all these requirements, and that in the future these, in conjunction with the regular inspection of cows by veterinary surgeons, may ensure to the public, and especially the poor, a pure milk supply; but at the same time I think that reasonable time should be given to all the smaller dairymen to enable them to carry out alterations which involve great outlay. Many of these small dairymen who will be brought under the jurisdiction of the medical officer of health by the new Milk Bill are quite unable to expend much capital, and to force expenditure upon them within a period of years would simply mean financial ruin, as the trade, especially in country districts, is not a prosperous one; and I trust that, provided a milk seller takes all the precautions as regards cleanliness, the more expensive matters such as new cowsheds may be allowed to extend over a period of years.

VOLUNTARY NOTIFICATION OF PHTHISIS.—That slightly more than one-third of the phthisis cases were notified to me is a very disappointing proportion, and with the figures recorded in previous years shows that voluntary notification cannot be considered a success. In the towns in which voluntary notification has proved a marked success there has generally been made available to the patient some definite advantages. In some cases he has been sent to a sanatorium at the expense of the municipality, and there trained for two months in the proper treatment of his disease, how to live properly, etc., while the patient himself is markedly benefited by the treatment and improved dietary. In other cases substantial assistance is forthcoming as regards additional food, clothing, care of the children in the home, etc. In all these cases notification is a boon to the patient, and is largely sought after by him. As a consequence a much greater proportion of notifications are received, and notification usually at an earlier stage. Voluntary notification which does little or nothing for the personal assistance of the consumptive is rarely more than a partial success.—*Annual Report of Dr. W. G. Savage, Medical Officer of Health, Colchester.*

NEEDLEWORK IN SCHOOLS.*

By JAMES KERR, M.D.,

Medical Officer (Education) London County Council.

IT is possible to get most beautiful specimens of patching done by children as young as 5 years of age, but it is not wise. The immature eye of a young child is quite capable of working efficiently in accommodating itself to vision for all objects over a foot distant, but the rate of increase of accommodative effort increases out of all proportion as objects are brought nearer to the eye. The child generally sacrifices clear vision to a bigger image not so clear, and tends to work on fine objects at 4 to 6 inches distance. The ultimate results to vision in many cases are serious and the nervous strain great.

The nerve groupings which are concerned with finger work are so immature that children in the infant department, at 6 or 7 years of age, can only use the muscles concerned clumsily, and with immense strain to themselves and more remotely to the teachers also. Knowing the physiological importance of these facts, the following articles were inserted in the London County Council School Management Code, 1904:—

110d. ii. It is exceedingly important that the children should be prevented, as far as is possible, from acquiring the bad habit of working with a short distance from eye to work. In no case should any child be permitted to occupy itself with work nearer to the eye than a foot distance.

iii. In infants' departments, in girls' when sewing, in boys' writing or doing fine drawing or painting, children often bring their eyes down closely to their work, enduring cramped chests, round backs, and much eye-strain. During such work teachers should pay especial attention to prevent these habits, and endeavour to secure observance of a proper working distance.

147. v. Teachers of girls' and infants' departments are instructed to study the eyesight of children when doing needlework, by seeing that they have sufficient light, and by strictly adhering to the Government Regulations.

In 1905 it was reported by the Council's officers that this article—i.e., 110 (d) of the Code—was practically ignored in nearly all our schools.

Dr. Louisa Woodcock has therefore investigated sewing as actually taught in thirteen schools, including some with a considerable alien population, and has endeavoured to discover the relations of such needlework to visual defect and nerve strain. Sewing was abolished in infants' schools in 1905 for all children below standard I., that is below the age of 6, but is still taught between 6 and 7. Especial attention has, therefore,

* Annual Report, 1908.

been paid to these children. The method of investigation was first simply to note children at work, without in any way criticising, and later to endeavour to find out the kind of work aimed at, and the reason for it. In 100 children, standards I. to IV. and aged from 6 to 10, doing either sewing or knitting, 84 per cent. held their work at from 4 to 6 inches distance or nearer, and the 16 per cent. who had a better working distance were mostly knitting. Knitting, with one exception, was held further off than sewing; the exception was a girl of 7 wearing glasses, who from habit held her knitting 3 inches away, although she could work equally well at a greater distance. No child worked at the distance of 12 inches recommended in the Code. The children seemed to find it less effort to hold the work near. No instructions as to eye distance are usually given by the teachers, although some trouble is taken about this matter in regard to reading. The rule is for sewing to be held very closely, knitting nearly double the distance, whilst reading is done at three or four times the distance of sewing; and often when the reading is held nearer it is found that it can be done equally well further off. For instance, a girl in standard III. whose sewing was held $2\frac{1}{2}$ to 3 inches off, and who had already had a red warning card in regard to defective vision, read her book at 6 to 7 inches, but when asked to hold it at 13 inches read equally well. The evidences of strain which Miss Woodcock noted as commonest are:—

(i.) A bad position of the body, the work usually being pressed closely to the chest to obtain a *point d'appui*, entailing a stooping posture, and rounded and high shoulders. Sometimes this point is attained by fixing some other part of the body, by fixing the head, or by resting the elbows on the desk, or pressing the knees up against desk edge, and so on.

(ii.) Squinting, which shows itself where the child keeps up its accommodation and the convergence overacts. It is temporary, but means eye strain which may be a preliminary to changes ending in myopia.

(iii.) Corrugated forehead, overaction of the frontal muscles forming horizontal creases, knitting of the eyebrows.

(iv.) Twisting of the body and neck, the head being held sideways from inco-ordinate action of muscles of the two sides.

(v.) Grimacing. The mouth often open, due to muscular relaxation and "habit spasm" of the face. There is also muscular spasm due to over action in the efforts to control the finger movements. It is only when these actions are excessive and long continued that they can be classed as indicating injurious strain.

On all points there are abundant instances of the effects of the work, but single typical cases will be quoted as illustrative of the effects noted.

In a standard I. class of 28 in a girls' school, ages 6 and 7, the children were hemming with a needle No. 7 about 10 stitches to the inch in a poorly lighted room. A few minutes after beginning work 10 were squinting, especially when threading the needle, 11 were knitting the eyebrows, 2 standing up to sew; and 6 stopped working. Halfway through the hour only 4 children did not present nervous effects, and at the end of the hour only 1.

In standard II. of the same school, average age about 8, half the class knitting, and the other half (20) sewing, of whom 16 were working in a bad position and 9 squinting.

In the higher standards the girls tend naturally to hold their work at a reasonable distance, perhaps a third of the number working quite satisfactorily. It is in standards I. and II. that nervous overstrain and awkward postures are so apparent, and from the length of these children's arms, 10 inches eye work distance should be quite comfortable for them. In one school where 24 girls were hemming in the same room as 34 boys, all being about 7 years of age, only 1 boy was frowning whilst 17 girls were doing so. These girls had had six previous lessons in hemming, including four of drill, so that this was the second lesson in hemming a specimen. Each specimen had been inked in red and black dots by the teacher, about six stitches to the inch to ensure regularity of stitch. The wasteful expenditure of nervous and muscular energy displayed by these children and the clumsiness of the hands of all the 24 was most striking. Twenty-one held their hands close to their chest wall, entailing bent head, and chin sunk in chest, raised shoulders, or heads held sideways and bodies twisted; 3 were squinting, and only 1 held her work at a reasonable distance.

The threading of needles is a very difficult task for many. The needles size 7 and 8 (are about 3.3 cm. or $1\frac{1}{4}$ in. long) have very small eyes (.6 mm. by .25 mm.). The difficulties of the young children are increased by their needles becoming constantly unthreaded. Two lessons are usually devoted to learning to thread needles. Watching 40 children of standard I., age about 7, many of them held the needle about three or four inches off, and one tried for half an hour unsuccessfully; the teacher stated that this child had spent the whole of the previous lesson in unsuccessful attempts. In a standard I. 39 were present and the light was not good, the windows having double-ribbed and wired glass. Fifteen of the class were frowning, 10 were threading their needles, and the notes made were:—

(a) Two are squinting.

(b) N. R. (vision = 6/24) spent 25 minutes in

trying to thread a needle; frowning, with twisted limbs, she was continually letting the needle fall, and spent most of the lesson time under the desk.

(c) T. S. (according to the teacher, slightly defective mentally) did not succeed in spite of all her attempts in 30 minutes.

(d) E. N. (vision = 6/9) sighs heavily, she sits in the front row in a bad light, and cannot thread her needle in 5 minutes.

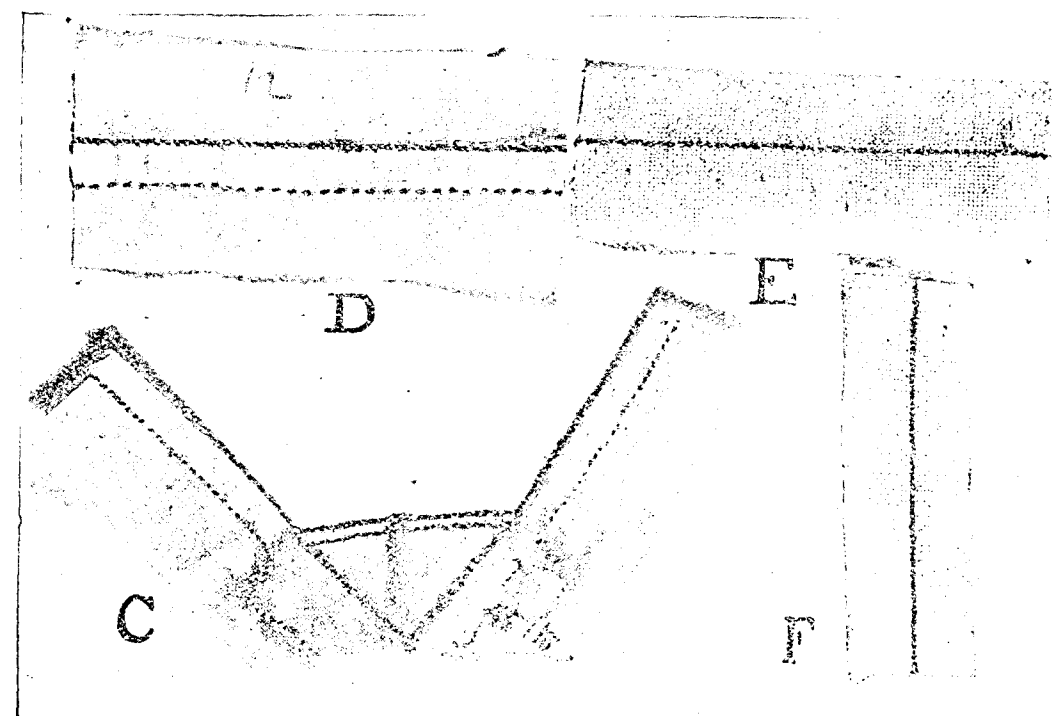
(e) J. E. (vision = 6/36) holds her needle $4\frac{1}{2}$ in. from the eye, opens her mouth all the time in the effort; succeeded after ten minutes.

It was noted, too, that the children occasionally suck the needles instead of the end of the cotton, and some suck their thimbles; as these thimbles

adenoids; but in connection with needlework lessons headaches do occur and children crying with headaches are almost peculiar to the needlework lesson.

THE LEARNING OF SEWING.—Standard I.—Hemming; oversewing (specimens), plain knitting, strips of cotton with two steel or wooden needles. Making articles for use—Hemming handkerchiefs (for sale), dusters, bean bags (for a game), pillow-slips. The materials on requisition are coarse canvas, unbleached calico, white calico (Horrocks), cotton (red, blue or green).

A child in standard 0 of a junior mixed department is taught first to thread a coarse needle or threader (about two lessons). She then learns a thimble drill in four parts, after this a needle drill



ACTUAL SIZE.—C (Aet. 12). The gusset has 46 stitches to the inch. D (Aet. 7-8). Hemming specimen with 13 stitches below and 25 above. E, F. Back-stitching: unnecessary and hurtful; threads counted.

are used promiscuously they will have to be remembered if sore throats should be prevalent.

On the other hand, in a standard I. where the children are dull, backward and of the truanting class, aged 9 and 10, and in standard II., aged 11 and 12, where they had been taught hemming on coarse canvas with a large-eyed rug needle, most of them threaded a small-eyed needle for the first time quickly, although the younger children again held the needles 3, 4 or 5 inches off the eye. Headaches from eye work are rare in the elementary schools. They are almost unknown as ocular headaches, being chiefly associated with home conditions of debility and want of ventilation, and in children generally with nasal obstruction from

which is different in the case of knitting, hemming and oversewing. One may hear these drills chanted over for ten minutes at the beginning of a lesson, the children making the fine movements without using cotton. The drills make an adult realise how complicated these fine, and in later years automatic, movements really are. In answer to an enquiry about a class of 64 seven-year old girls the head-mistress wrote that on testing the needlework class after seven lessons, including three preliminary lessons, no child could really work a hemming exercise, holding needle and work quite correctly, and that several further lessons would be necessary. Mr. Cecil Rowntree finds the sewing drill in universal disfavour. It

the existence of conditions of an unfavourable character which affect the child, through the mother, prior to its birth. And I invite attention to these considerations because it is so commonly assumed that infantile mortality is due almost entirely to imperfect or improper feeding of the child; and if you include in your definition of the feeding of infants the nutrition of the mothers there is a strong case to be made out. Infant mortality cannot be dissociated from *pre-natal* influences and be regarded as due solely to *post-natal* causes. A considerable proportion of the parents are naturally of enfeebled constitution—some are intemperate drinkers, many are relatively underfed, and others not so much under as unwisely or intemperately fed. Some of the mothers induce in themselves undesirable conditions of debility, *e.g.*, by working too strenuously during the later stages of pregnancy, or by bearing children too rapidly, etc. In short, we have always to keep in our minds Burke's definition of the community, viz., that it is "*a partnership not only between those who are living, but between those who are living and those who are dead, and those who are to be born,*" and must endeavour rightly to estimate the antecedents to death, and it is in respect of these that *ante-natal* conditions become so important.

The Notification of Births Act came into force in the City on the first of the year and through its operation the Health Department received directly information of more than half the births and directly and indirectly of three-fourths. I regard this Act as being specially useful in giving us early information of births where no doctor is in regular attendance; the early call of the Health Visitor at the home enables us to give advice respecting the feeding of the newly born infants of the greatest value. It is by means of these visits that I get knowledge of badly nourished mothers and can recommend them to the Sick Poor Society for assistance. Moreover, the call of the Health Visitor personifies the interest which the community, as a whole, takes in the welfare of the most helpless of its constituents; and, exercised with tact and discretion, this interest becomes a stay, support, and encouragement to the well-meaning parent, and a reproof, reproach, and restraint to the indifferent and the careless. It is by means of these visits, aided by a constant if gradual heightening of the general level of intelligence, that we have to alter much in the racial attitude toward the obligations of maternity and of paternity, and to substitute for well-meaning ignorance, and an ethically demoralizing disinclination to take trouble, a civic consciousness that rightly to rear up a future citizen is a racial duty committed to the care of the parents, the efficient discharge of which is as patriotic a service as can be rendered to the State.

THE VALUE OF HOSPITAL ISOLATION IN SCARLET FEVER.*

By G. SOWDEN, M.D., D.P.H.,
Medical Officer of Health, East Ham.

DURING recent years it has been stated that isolation hospitals are of no value in limiting the spread of scarlet fever, and that towns where a majority of the cases are nursed at home have no greater prevalence of this disease than towns where the majority of cases are admitted to hospital. No doubt very much depends upon the character of the towns and the average size of the houses, etc., but the statistics for East Ham lend no support to this theory. On the contrary, they confirm what would naturally be expected, viz., that prompt removal to hospital does, at least in a town of this character, tend to limit the number of cases of the disease. During the past year the following figures have been obtained in connection with this question:—

In 235 houses one or more cases of scarlet fever were nursed. In 63 of these houses (26·8 per cent.) further cases of the disease occurred.

From 288 other houses one or more cases of scarlet fever were removed to hospital. In 35 of these houses (or 12·1 per cent.) further cases of the disease occurred, that is, less than half as many as occurred when the cases were not removed to hospital.

In the 63 houses first mentioned 83 further cases of the disease occurred, of which 33 (39·7 per cent.) arose within seven days of the first case, and 50 cases (60·3 per cent.) were infected at a later period.

In the 35 houses next mentioned 48 further cases of the disease occurred, of which 26 (54·2 per cent.) arose within seven days of removal of the first case, and 22 cases (45·8 per cent.) occurred later. There is no doubt but that many, if not all, of the cases here mentioned as occurring within seven days were already infected before removal of the first case to hospital, therefore the sooner the cases can be removed the smaller should this number become. Of the 22 cases occurring after the first week many were doubtless contracted at school, etc., for 14 days after the removal of a case to hospital the other children in the house are allowed to attend school. In cases where a child is nursed at home the other children are excluded for the whole period of the illness, and therefore the risk of outside infection is reduced. This is an additional factor in favour of hospital treatment.

Living in the 235 houses where cases of scarlet fever were being nursed were 531 children who had not previously had the disease as stated, 83 of these contracted the disease. This equals an attack rate of 15·6 per cent.

* Annual Report, 1908.

Living in the 288 houses from which cases of scarlet fever were removed to hospital were 823 children who had not previously had the disease, as stated, 48 of these subsequently contracted scarlet fever. This equals an attack rate of only 5·8 per cent., or practically only one-third as many.

It should also be stated that the cases nursed at home are those where possibilities for isolation

are the best, the house of fair size, and, as a rule, with not many children. The cases removed to hospital are more often those from small houses, with many other children, and therefore the risk of infection to others before the case is diagnosed and removed is here the greatest.

The following table gives all the particulars above recorded, and shows at once the difference in the two groups of cases:—

	Number of Houses in which no further cases occurred.	Number of Houses in which one or more additional cases did occur.	Total number of additional cases of the disease.	Number of children present who had not previously had scarlet fever.	Percentage of these children attacked.
HOME TREATED in 235 Houses ..	172	63 or (26·8 per cent.)	83 33 occurred within 7 days. 50 occurred later.	531	15·6
HOSPITAL TREATED from 288 Houses ..	253	35 or (12·1 per cent.)	48 26 occurred within 7 days. 22 occurred later.	823	5·8

THE CLEANSING OF SCHOOLROOMS.*

By H. MEREDITH RICHARDS, M.D., D.P.H.,
Medical Officer of Health, Croydon.

DURING the past year the vendors of disinfectants have been more than usually persistent in vaunting their wares—a persistence which is perhaps only equalled by the candour with which they criticise the statements of rival firms. Now disinfection undoubtedly is occasionally of service in checking the spread of disease. Thus the disinfection of the clothing of the sick, of their infective discharges and of infected articles such as pencils and slates, is a wise precaution, amply justified by experience. On the other hand, the suggestion that we should sterilize the walls and floors of class-rooms by chemical means seems to be based on a misconception of the natural history of the diseases it is proposed to check, and a failure to estimate the relative importance of the various channels by which they are spread. Consider, for instance, two of the commonest and most serious school epidemics—measles and diphtheria. In both these diseases infection is given off from the throat or nose of the sufferer and, in the vast majority of instances, from no other part of the body. Measles is specially infectious, because cough is an early symptom of the disease, and every time a measles patient coughs infectious material is sprayed into

the atmosphere. Should any susceptible children inhale these infectious droplets in sufficient dose they are said to have caught the disease and will develop characteristic symptoms in due course. Rarely infective material may settle on the clothing of an insusceptible person and be conveyed in that way to some other child. There is not, however, a tittle of evidence that measles infection clings to walls, floors and desks. Indeed, the contrary is proved by overwhelming evidence. Thus, if a primary case of measles were discovered in a class of susceptible children on, say, January 1st, and was isolated after one session's attendance at school, one would find that secondary cases would occur between January 9th and 14th (*i.e.*, during a period corresponding to the known incubation of the disease, assuming that infection was acquired on January 1st). What one does not find are cases with onsets from January 14th to 20th, as one would do if a measles child infected the walls and floors. In other words, one must seek to control measles on the assumption that it spreads from the sick to the healthy, and not through the medium of infected plaster and boards.

Similar remarks apply to diphtheria of the throat, which happily has a more limited power of spread because it is not commonly accompanied by a cough to mechanically expel infection into the atmosphere. Nasal diphtheria is somewhat more liable to diffuse, because infected secretions can

* Annual Report, 1908.

more readily be conveyed from the sick to the healthy.

It may, I think, be affirmed of these diseases, which are typical of school epidemics:—

(1) That infection nearly always spreads in the direct way just described.

(2) That occasionally infection may be transferred by the medium of clothing, pencils, handkerchiefs and so forth.

(3) That whatever infection reaches the floors and desks is so small in amount that it can be rendered innocuous by attention to the ordinary rules of cleanliness and by free ventilation.

I would therefore deprecate resort to routine disinfection, firstly because there is no evidence that it is necessary, and secondly because it would be likely to absorb attention and money that can be spent more profitably in securing greater use of soap and water, and more thorough perfilation of class-rooms.

If the healthiness of school buildings is to be increased, there is no doubt that attention should be concentrated on obtaining more thorough ventilation, and more frequent washing of floors, desks and walls. In order to facilitate the latter operation in future schools it would be an advantage if one of the jointless impermeable floors were substituted for wood blocks and boards. The desks and seats should also be fixed with standards so arranged as not to afford lodgment for dust and interfere with the free use of swabs and brooms. There is no insuperable difficulty about this, and one of the jointless floors has already proved successful at Winterbourne Road.

A SCHOOL CLINIC FOR CONTAGIOUS SKIN DISEASES.*

By DUNCAN FORBES, M.D., D.P.H.,
Medical Officer of Health, Brighton.

IN October, 1907, following a recommendation by the previous medical officer of health, Dr. Newsholme, to the Education Committee, a weekly consultation for the treatment of contagious skin diseases was started.

Up to January, 1908, 123 cases had been treated at the clinic.

The cases usually attend weekly, unless under proper home supervision, when some are allowed to attend once a fortnight. As far as is possible, children whose parents can afford medical advice are not treated at the clinic, but are sent back to their medical attendant. Those parents who can afford to pay for the ointment provided are invited to do so.

The majority of cases at the clinic are sent by the school nurse (Nurse Payne), but since the routine inspection of the schools started an

Annual Report, 1908.

increasing number are sent by the school doctor. It is an encouraging sign of the interest taken in the scheme by the head teachers that the number of children sent by them is also increasing.

There is evidence that the clinic improves school attendance; several cases have come under observation of impetigo arising from pediculosis, in which the child has been absent for three or four months, while, with proper treatment, the affection has been cured in ten days, and the child has returned to school in a fortnight.

Visits are made to the homes of certain of the worst cases, and assistance is given to the mother in the treatment; this personal demonstration is of material advantage. In this connection the number of home visits made by Nurse Payne was 419.

Cases of scabies are treated in the borough sanatorium when a spare ward can be obtained. Their stay in the sanatorium is limited to some ten days, during which time their clothes are disinfected and the skin condition cured. Advice is given to the parents as to the cleansing of the sheets, etc.; the duration of the disease is much lessened.

The following record shows the number and nature of the cases treated during 1908:—

Disease.	No. of cases.	Attendances.	Results.
Vermineous condition of head ..	53	162	Improved.
Ringworm of head ..	111	759	{ 133 cured, 6 sent to private doctors
" body ..	28		
Eczema ..	44	127	Cured.
Impetigo ..	62	90	Cured.
Scabies ..	20	76	Cured.
Ciliary blepharitis ..	12	25	Cured.
Phlyctenular ulcers ..	4	6	3 sent to hospital.
Conjunctivitis ..	3	16	Cured.
Alopecia (other than ringworm) ..	7	28	Improved.
Other conditions ..	12	13	10 sent to hospital, 2 cured.
Total ..	356	1,302	

Number and nature of cases at present under treatment:—

Vermineous heads ..	..	..	3
Ringworm ..	..	..	53
Scabies ..	..	..	6
Impetigo ..	..	..	4
Eczema ..	..	..	10
Blepharitis ..	..	..	6
Alopecia ..	..	..	3
			85

The clinic was held 41 times during 1908, the average number attending being 32.

Expenditure on the clinic, etc.:—

Ointment, etc. ..	..	£2 13 5
Paid by patients ..	..	2 7 5
Deficit ..	..	£0 6 0

149 boxes of ointment were given away.

The rooms in which the clinic is held are in the school for mentally defective children. The hours for attendance are from 3.30 to 5 p.m. on Tuesday afternoons.

RESULTS OF RECOMMENDATIONS TO OBTAIN TREATMENT FOR DEFECTS IN SCHOOL CHILDREN.*

By T. HENRY JONES, M.A., M.D., D.P.H.
Education Medical Officer, Surrey County Council.

IN order to get definite information of the results of the formal recommendations made to parents to obtain necessary treatment for their children, lists were prepared at the end of the year of all such recommendations made during the routine inspections in 1908. These were sent to all the schools in January, 1909, with the request that the results should be entered in them by the head teachers, after necessary inquiries. The lists were to be returned to me by the beginning of February. The interval thus allowed for obtaining treatment for the children inspected at the end of the year was not great; the return of results cannot, therefore, be taken as final. Many of the recommendations will not be followed by treatment until several months have elapsed; for example, throat operations are postponed in the winter season, parents put off journeys to hospital at Christmas time, and the natural tendency of many people to delay must be taken into account.

A classified statement of the 2,017 defects for which recommendations were made to obtain treatment after the routine inspections has already been given. Particulars have been received of the results of 1,739 of these recommendations. These are classified below in tabular form, together with the known results of 252 recommendations made to obtain ophthalmic treatment after the special examinations, which are included here on account of their importance.

It will be seen from the table that up to February, 1909, nothing had been done for 55.7 per cent. of the children for whom recommendations had been made in 1908, about whom returns had been received; also that 5.2 per cent. of these children had left school without having obtained treatment so far as was known. In 5 per cent. of the cases definite promises had been made by the parents that treatment should be obtained. In 5.6 per cent. of the cases home treatment only had followed the recommendations, often with unsatisfactory results. In 28.3 per cent. of the whole number treatment has been obtained, of a satisfactory kind so far as could be ascertained. I have reason to believe, however, that in some of the cases included in this column, the exact number of which cannot be stated, only druggists' treatment had been obtained. The large proportion of children with decayed teeth for whom no treatment was obtained considerably affects the percentages given in the table.

* Annual Report, 1908.

SUMMARY OF RESULTS OF RECOMMENDATIONS TO OBTAIN TREATMENT.—WHOLE COUNTY.

Recommendations to obtain treatment for:	Treatment apparently satisfactory obtained.	Home treatment, or treatment by druggists of doubtful sufficiency.	Definite promises made to obtain treatment.	Nothing done.	Left school; nothing done while at school.	Total recommendations.
Teeth decayed ..	60	—	14	385	44	503
Tonsils enlarged ..	51	—	8	138	12	209
Post nasal adenoids ..	48	—	14	54	2	118
Tonsils and adenoids ..	62	—	15	87	13	177
Glands enlarged ..	1	1	—	1	—	3
Eyes—						
External diseases ..	21	8	—	19	—	48
Defective vision ..	202	10	38	333	26	609
Ears—						
Chronic discharges ..	15	4	—	29	1	49
Defective hearing ..	8	1	1	12	—	22
Speech defective, cleft palate ..	1	—	—	7	1	9
Heart diseases ..	1	—	—	3	1	5
Lungs—						
Chronic bronchial catarrh ..	12	1	5	5	—	23
Pulmonary tuberculosis ..	4	1	—	—	1	6
Nervous diseases ..	2	—	1	2	—	5
Digestive diseases ..	—	1	—	1	—	2
Skin diseases ..	6	5	—	5	—	16
General diseases ..	7	11	—	11	2	31
Other medical recommendations ..	5	1	2	1	—	9
Deformities ..	2	4	—	5	1	12
Other surgical recommendations ..	9	—	3	7	—	19
Infectious diseases ..	9	17	—	—	—	26
Contagious ..	38	48	—	4	—	90
Totals ..	564	113	101	1,109	104	1,991
Percentages ..	28.3	5.6	5.0	55.7	5.2	

Many of the replies of parents to the teachers' notes of inquiry have been sent to me as illustrations of their reasons for not obtaining treatment. They resolve themselves into two main classes: answers showing parental ignorance, and answers pleading inability to obtain treatment.

A very common reply to recommendations sent about decayed teeth was that the parents did not consider that they affected health; about enlarged tonsils similarly; about squint, that the children would grow out of it, that the father's eyes had been very bad when he was a boy, and so forth. Only personal interviews can produce any result in such cases; if the parents are not present at the inspections a written recommendation has little or no effect.

Inability to obtain treatment is, of course, common, although it is often given as an excuse when lack of effort is the real cause. But statements that the father is out of work; or that his wages are 14s. a week, from which nothing can be spared for journeys to hospital after rent, food, and clothes for a large family have been paid for; are common.

or that to go to hospital would mean loss of a day's work and pay, are typical of a large group of cases in which no result follows the recommendations made.

METHODS EMPLOYED OR AVAILABLE FOR THE TREATMENT OF DEFECTS.

No exact particulars can be given of the numbers of children treated by doctors in private practice or by parish medical officers, taken to dispensaries or to hospitals, or treated by druggists in consequence of the recommendations made after medical inspection. The nature of the treatment obtained was mentioned only in a few of the returns received from the schools, and it would hardly be possible to extend the inquiry so far in all cases.

Ten per cent. of the children who obtained treatment were stated to have been treated by their family doctors, but this is an incomplete return.

Twenty-two per cent. of the same group were stated to have received hospital treatment, but this again is a very incomplete return. It is, however, safe to say that the general tendency among the parents of elementary school children is to seek for gratuitous medical treatment, usually in hospital.

Dispensary treatment was not mentioned in any of the returns.

Poor law medical treatment was not mentioned; parents are found to be very reluctant to avail themselves of it in present conditions.

It is stated in the table that 5.6 per cent. of the total number included in it had received treatment from druggists or at home, often with indifferent results. Home care, intelligently directed, may be all that is required in many cases of ill-health. But it is obviously undesirable that treatment by druggists on an extended scale should be a direct result of medical inspection; such treatment may sometimes be better than none, but it cannot be regarded as satisfactory.

No treatment of any kind has been provided by the Education Committee.

The means of treatment now employed by parents are not always the best means available. The advantages of treatment at or near home are very often overlooked by people who think only of hospitals for this purpose. Repeated journeys to London or to some other distant town involve expense which is often considerable, much loss of time, it may be loss of wages, and possibly hurried treatment after all in over-taxed hospital out-patient departments for chronic ailments which might have been as well or better treated nearer home. To these drawbacks may often be added the exorbitant prices frequently paid to opticians and druggists for the spectacles and other appliances prescribed at the hospitals.

It must be in borne in mind that the medical treatment usually required for school children is not necessarily special treatment in any sense; most of the defects found are common defects such as are treated daily in ordinary practice.

There are few districts in which arrangements might not be made for the treatment of most common defects by local doctors. Many doctors would be willing to treat really necessitous school children at reduced fees, which would often amount to less than the cost of journeys to hospital. Experimental arrangements have already been made for this purpose in some districts. For example, doctors have agreed to test the eyesight of poor children and themselves to obtain spectacles at cost price from the makers, for nominal inclusive fees, provided that the cases were carefully investigated beforehand and recommended by school managers. Such a plan for the treatment of common defects should be capable of extension.

THE INFLUENCE OF CORSETS ON INFANT MORTALITY.—Perhaps a more potent cause operating in the decline in breast feeding is the fashion of wearing corsets, which have the same effect upon the internal and allied organs of the female as is the case in the bandaging of the feet with Chinese women—both producing atrophy or wasting of the parts affected. In the case of the Western nations, the altered circumstances are giving rise to a race of breastless women, more correctly defined, perhaps, as human females rather than women, in their deficiency in the perfect type of womanhood, and consequent inability to perform the complete and perfect function of motherhood.—*Annual Report of Dr. A. W. Martin, Medical Officer of Health, Gorton.*

THE DISINFECTION OF SCHOOLS.—In continuation of the work commenced in 1907, a number of inspections of schools have been made in order to note the state of cleanliness of the premises. Some slight improvement has been noted in particular instances, but in general there is much to be desired. In some cases spraying apparatus has been supplied, and the use of disinfectants has been commenced. There is, however, too great a tendency to rush to disinfectants as being less expensive than thorough cleaning. The use of disinfectants is an excellent practice when they are applied to clean rooms, but it must be understood that they do not remove dirt, and therefore cannot take the place of cleaning, nor can disinfectants kill infection when it is buried in layers of dust. Disinfection should be applied after cleaning, not in place of cleaning.—*Annual Report of Dr. M. J. Oliver, Medical Officer of Health, County of Roxburgh.*

DISINFECTANTS AND THEIR USES.*

By J. COOTE HIBBERT, M.D., D.P.H.,
Medical Officer of Health, Warrington.

UNTIL recently corporations have been using substances for disinfecting purposes without any definite knowledge that the preparations were efficient ones, and have taken with implicit trust the manufacturers' uncorroborated statements as to the efficacy of their wares.

Because the preparation has the power of destroying a smell, it has been accepted as a destroyer of the much more resisting germs which have given rise to the smell or which have been associated with these smell-producing germs.

It is now known that many substances will act as deodorisers, i.e., will destroy smells, but will have very little or no effect on the germs contained in the putrefying matter giving off the smell; and the application of one of these deodorisers to such matter is not only useless from the point of view of destroying infection but is even a source of danger, for the smell having disappeared it may be wrongly concluded that the infection has also disappeared. These deodorisers are also dangerous in another way—by destroying a smell they may do away with a very useful danger signal that something is wrong. They may be applied to organic matter which should be cleared away, and which, but for the action of the deodoriser, would be cleared away on account of the nuisance it would cause. But when a deodoriser is added, the matter is left lying about with all its contained bacteria because it does not smell or cause a nuisance. In like manner a deodoriser may be applied around a noxious gully, and may destroy the smell which would otherwise give the warning that there was some faulty construction in the gully or drain connected therewith. For such reasons as these I deprecate the indiscriminate use of disinfectants in such connections as with drains or insanitary areas because they tend to cause defects to be overlooked and adequate cleansing to be neglected, while they offer no security against infection.

To come now to the actual disinfectants, we have for some time past known from experiment and from actual experience that certain of these may be relied upon to kill certain germs under certain conditions. Chief among these disinfectants has been carbolic acid, which is even now, perhaps, one of the best all-round germ killers which we possess. Carbolic acid is, however, somewhat expensive for general use and is also a very strong poison; and for these and other reasons many rival preparations have been put on the market. Fortunately, by the aid of bacteriological experiment we are now able to test the

efficacy of these new preparations and to compare their germ-killing power with that of carbolic; and there are now many cheap disinfectants which have been shown by experiment to compare very favourably in germ-killing power with carbolic acid. The practical application of these experiments is, however, not yet complete, for the results of experiments conducted in the laboratory as to the action of certain disinfectants on microbes contained in water are not necessarily applicable to what occurs in the practical use of the disinfectant. In the everyday use of a disinfectant it is required to act on germs which are mixed up with matter of varied constitution, and which may in many ways be protected by this matter from the action of the disinfectant. With our present knowledge, we should not purchase a disinfectant unless the following conditions are fulfilled:—

- (1) We should know its germ-killing power when acting in solutions of certain strength on certain germs under certain conditions, these conditions being as far as possible similar to those obtaining in the practical use of the disinfectant. (These experiments must be carried out by a skilled bacteriologist, who must be independent of the manufacturers of the disinfectant.)
- (2) The manufacturers should guarantee the disinfectant to have a minimum germ-killing power when used in solution of certain strength on certain germs under certain conditions.
- (3) The disinfectant should be cheap and non-poisonous; it should be soluble in water or form a fine emulsion with it, and it should not possess chemical properties which unfit it for general use.

In the practical use of a disinfectant we must always see that it is used in requisite strength. The attempt to disinfect a drain or sewer by pouring down some disinfectant which, when mixed with the contents of the drain or sewer, cannot be of sufficient strength to kill any germs, is a waste of time and money. The same remarks apply to the watering of roads and the flushing-out of passages, etc., with disinfectant solutions which are so weak as to be worthless. Flushing with simple water is much to be preferred.

So-called "disinfecting powders" are, as a rule, useless for disinfecting purposes; they may act as deodorisers. Their use in connection with gulleys and insanitary areas is to be deprecated for reasons given above. Plain soap is often a far better cleanser than many of the so-called "disinfectant soaps," and the term "disinfectant" is often quite inapplicable to the latter soaps. It will be very advantageous if, as has been suggested, disinfectants are brought under the control of the Sale of Food and Drug Acts, the manufacturers

being compelled to state the minimum germ-killing power of the preparation when tested under certain fixed conditions, and authorities being empowered to take proceedings against the manufacturers under the above amended Acts if the disinfectants are found to be below the guaranteed standard.

THE BACTERIOLOGY OF MEASLES.

IN the *Zeitschrift fuer Hygiene und Infektionskrankheiten* (volume 63, part I.) there is a paper by Dr. Alexander Lorey (Hamburg-Eppendorf) in which are discussed organisms that cause the chief complications in this disease. The subject has hitherto received very little, if any, attention from bacteriologists, as practically all previous inquiries were directed to finding out the actual cause of measles. The author thinks that while measles of itself is a comparatively harmless illness it can become a very dangerous one owing to complications.

The first part of the paper is taken up with a description of the *technique* employed, the latter part being devoted to the organisms found.

In all 93 cases were bacteriologically examined with positive results in 86 cases; the seven negative ones referring to a few cases in which only harmless organisms were found in tonsils or middle ear.

In 41 swabs from the tonsils the results showed the presence of streptococcus erysipelatosus in 21, and in 5 cases along with diphtheria bacilli. In 14 cases the pneumo-coccus was present.

In pus from the middle ear streptococcus erysipelatosus was found pure in 23, and mixed with other organisms in 6. On examination of the blood, organisms were found in 22 (only positive results are given), the principal organism being streptococcus erysipelatosus, which was found in 15 cases.

The conclusions arrived at are:—

1. Erysipelas streptococci are the commonest cause of complications.
2. The gravity of a measles epidemic depends on the frequency of invasion by this organism.
3. The discovery of a considerable number of these in the throat shows the presence of secondary infection, and increases the gravity of the prognosis. If found in the blood the disease is almost always fatal.
4. The point of attack is the upper air passages.
5. Pseudo-croup appears to be due to a pneumococcal infection.

In hospitals these organisms are mostly conveyed from patient to patient by the hands of nurses and other attendants on the sick, food utensils, playthings, etc., and also through cough-spray. The best preventative is proper isolation of complicated cases.

SOME ADVANTAGES OF THE COUNTRY SCHOOL.*

By GEORGE A. AUDEN, M.A., M.D., M.R.C.P.,
Medical Superintendent of Elementary Schools,
Birmingham.

IT will be universally admitted that, *ceteris paribus*, debilitated children are best away from crowded school-rooms, and in the open fields and, where any such provision exists for such a transference, to retain them in the city schools would be reprehensible. Practically, however, the child who is certified as unfit to attend school on account of tuberculosis or other debilitating disease is not infrequently found employed in household duties or, at any rate, without access to the fresh air which is the object of the absence certificate. There is, in addition, the real disadvantage that the child who is not attending school is readily lost sight of, while, at the same time, he misses the regulated order of daily life which school entails, together with all the social influences which are exercised by the school. School life for the majority of elementary school children ends so soon that the loss of a few months or a longer period at the latter part of their school life is a very great disadvantage to them in the keen struggle for existence, into which they must plunge at the end of their school career. This is more especially true of those children whose enfeebled bodily condition prevents them from taking up any form of physical work, the necessary educational endowments of which are not of a high order; but it is still more true of the tuberculous children, whose struggle against the disease necessarily extends over the greater part of their adolescent years. Thus, absence from school, so far from helping them to a finally successful issue in the struggle, actually militates against their chances by lowering their wage-earning efficiency, and thus forms a vicious circle from which the unfortunate sufferer cannot free himself. Education Authorities are, therefore, on the horns of a dilemma in this question, for it is plain that if these children are to be compulsorily educated at all (and both the interests of the State and the individual demand it), then the duty is imposed upon them of supplying such a form of school curriculum as will at once improve both their bodily and their mental condition. One form of educational institution alone satisfies these two demands. The open-air school, which is the result of the compromise between the State, the parent, and the physician, has now passed beyond the experimental stage, and is an attempt "to adapt the school organisation and the amount and methods of instruction to the physical and mental capacity of all types of elementary school children." The history of these

* Annual Report, 1908.

open-air schools dates back to the inauguration of the Charlottenburg School in 1904. The first school on these lines to be started in England was that at Woolwich, opened in 1907. The success of this experiment was so remarkable that in 1908 the London County Council had three open-air schools, and in 1909 there will be five schools worked upon these lines. Bradford and Halifax have made a move in the same direction, while Manchester has also a "Country School for Town Children," where a fortnight's education in the country, with board and lodging, is given to selected groups of children from the elementary schools during the summer months. These schools are not primarily intended for the child suffering from pulmonary tuberculosis; in fact, great care is necessary in the selection of children thus suffering, and the children are as a rule drafted back into ordinary schools after three months. The greatest improvement is seen in those who are suffering from anæmia or enlarged glands, while concomitant with the physical improvement, the general moral improvement which is shown is extraordinary. The removal from the influence of the street and the placid attitude of mind induced by the post-prandial sleep and the quiet open-air life amongst the trees, together with the cultivating influence of the teacher, with whom the personal contact is so much closer and more prolonged than in an ordinary school, all conspire towards an improvement in the mental stability of the children.

SCHOOL ATTENDANCE.*

By H. COOPER PATTIN, M.A., M.D., D.P.H. AND
D. MORLEY MATHIESON, M.A., M.D., D.P.H.,
School Medical Officers, Norwich.

FROM the point of view of economy, this part of the work of the medical officer is of special importance. Parents frequently either take no trouble to see that their children attend school or keep them at home to do work, run errands, etc. An indefinite plea of "illness," past or present, is advanced, and in a few cases a medical certificate is produced of such distant date as to be of questionable significance.

It is often impossible for an attendance officer to decide where absence is or is not justified on the medical grounds. On the one hand, there are the fraudulent cases; on the other, there are children who are physically unfit to attend school, but whose condition can be adequately ascertained only by a medical examination.

As the loss of grant every year for feigned cases of illness is considerable, it is necessary that, where illness is professed, children who are not already under medical care, and certified accordingly, should be examined carefully, the genuine

* Annual Report, 1908.

cases of disability being directed to secure medical advice, the others being certified fit for school.

The arrangements made with the chief attendance officer for dealing with these cases are as follows:—

The children selected by the attendance officers week by week are sent up to the Municipal Buildings, accompanied by some responsible person, with brief particulars entered on a printed form (Form 4). The case is considered, where necessary the child is examined, the particulars are entered on the form, and the latter is filed for future reference.

(1) If the case appears on consideration to be one where the child is malingering, or has been unjustifiably kept from school by the parents, a certificate (Form 5) is filled up. This certificate is used subsequently where prosecution is thought desirable by the School Attendance Committee.

(2) If the child is found to be in some way medically unfit, the parent is told to secure adequate medical attention for it, and a certificate sent accordingly (Form 6). These cases are not certified "unfit" for an indefinite period, but are asked to return on a fixed date: in order firstly that the certificate granted may not be abused, and secondly that the date of returning to school as decided by their medical attendant may be adhered to, and that any special suggestion relative to the child's school work, etc., may be communicated to the teacher.

Over 600 examinations were made in connection with this department in 1908. It is unnecessary to go into detail with regard to the cases seen; the genuine cases included children suffering from heart and lung disease, defective hearing, eyesight, etc. But mention may be made of a class of case, unimportant in itself, which gives much trouble—that of children suffering from infectious skin diseases. These children cannot be permitted to mix with their fellows in school until they are free from infection. Parents who recognise this, and who wish for some reason to have the child at home, take care to forget to carry out treatment, so that a disease which, if properly attended to, could be cleared up in a few days, is allowed to run on for weeks and months.

ACCOMMODATION FOR MEDICAL INSPECTION.

For the room in which medical inspection is to be conducted the following are the desirable qualifications:—

- 1.—Suitable size.
- 2.—Good lighting and ventilation. (For the examination of the throat, for example, the light should come from the side and not from above.)
- 3.—Privacy. (Besides the parent of the child and the nurse or health visitors appointed for the purpose no other person should be in the room or in a position to overlook the room.)

REVIEWS.

HOUSE-DRAINAGE, SEWERAGE, AND SEWAGE DISPOSAL IN RELATION TO HEALTH. By Louis C. Parkes, M.D., D.P.H., Medical Officer of Health, Chelsea. London: H. K. Lewis. Price 2s. net.

In this book Dr. Parkes has published his Chadwick Lectures, which were delivered at the University of London in February, 1909. The book consists of four sections, which are devoted to the following subjects:—The causation of disease by excretal refuse, conservancy methods of excreta removal, modern methods of house drainage and sewerage, and the disposal of sewage. Dr. Parkes has taken considerable pains to collect the latest information, and his researches extend over a very wide area; and his clear and compendious discussion of sewers and drains in relation to public health—a subject the importance of which tends to be much under-estimated at the present time—should be welcomed by all who are engaged or interested in public health work. Many of the questions dealt with are highly contentious, but Dr. Parkes discusses the various conflicting opinions with conspicuous fairness and impartiality; he is a supporter, for instance, of the intercepting trap and of surface roadway gratings, but he is by no means blind to the disadvantages of both. The book is well written and eminently readable, and, as a very sparing use has been made of technical expressions, there is no reason why it should not be read with profit by any intelligent layman. We can strongly recommend the book, and have no doubt that it will secure a wide circle of readers.

SANITARY LAW AND PRACTICE: A HANDBOOK FOR STUDENTS OF PUBLIC HEALTH AND OTHERS. By W. Robertson, M.D., D.P.H., Medical Officer of Health, Leith, and Charles Porter, M.D., B.Sc., M.R.C.P. (Edin.), Medical Officer of Health, Marylebone. London: The Sanitary Publishing Co., Ltd. Second edition. Price 10s. 6d. net.

The progress of sanitary science and practice during the four years that have elapsed since the first edition of this book appeared has made it necessary for the authors to introduce a considerable amount of new matter in the second edition. This, however, has been done without, as, unfortunately, too often happens on these occasions, increasing the bulk of the volume to an unwieldy extent; for by the omission of some less important matter, by judicious compression here and there, and by a slight reduction in the size of the print, the authors have succeeded in adding a great deal of information to their book with but a small increase in the size of the volume. The

new matter includes a section on school medical inspection and another on vital statistics, the latter being particularly well done; and additions of considerable importance have been introduced into the sections relating to the prevention of tuberculosis, sewage treatment, meat inspection, and the protection of child life.

The original scheme of construction remains unaltered. The subject-matter is contained in forty-eight sections, each section being, as far as possible, self-contained, and relating to some definite branch of public health work; for example, water supply, or common lodging-houses. The law on the subject is first stated and explained, and then a clear and concise account is given of the way in which the law is applied in actual administration. This scheme is well adapted to the needs of the public health student, who usually finds sanitary law an inextricable maze of confused and elusive assertions. In this book the student can find his way about, and get hold of the information he wants on any given subject without hunting to and fro from statute to statute. The authors have been singularly successful in their exposition of sanitary law and practice; they really give the student a good insight into the practical working of a public health office, and in this respect their book is pre-eminent among text-books on public health. The student preparing for the diploma in public health will find the book a labour-saving instrument of great value, and it will also be found useful by public health officers.

JOSEPH TOYNBEE, F.R.S., AURAL SURGEON. By Gertrude Toynbee. London: Henry J. Glazier. Price 3d. net.

Miss Toynbee's charming little memoir of her father will be welcomed by all who hold the work of the early public health reformers in grateful remembrance, for Joseph Toynbee—the father of Arnold Toynbee—was one of those eminent men to whom we owe the movement for sanitary reform in the first half of the nineteenth century. Though much occupied in his practice as an ear specialist, Joseph Toynbee found time to take an active part in public health affairs. He gave evidence before the Health of Towns Commission in 1846, and he was one of the founders of the Metropolitan Association for Improving the Dwellings of the Working Classes, and of the Commons Preservation Society. He wrote numerous leaflets on popular hygiene which had a wide circulation, and he was an active lecturer on public health subjects. Joseph Toynbee was a man of a singularly interesting personality, and we hope Miss Toynbee will at some future time give us a more detailed account of his life and work.

LAW REPORTS. HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

June 15th, 1909.

BEFORE LORD ALVERSTONE, L.C.J., JELF AND A. T. LAWRENCE, J.J.

FRENCH v. CARD.

Sale of Food and Drugs Acts—Refusal to Sell Sample—New or Skimmed Milk—Label on Can.

An inspector demanded a sample of new milk from a particular can. The defendant refused to give it to him, and spilled the whole of the contents on the ground, alleging that the can contained only skimmed milk. It was held that he could not be convicted of refusing to sell new milk to the inspector as there was no evidence that he was selling the milk as new. The fact that the can was not labelled "skimmed milk" was immaterial, as Section 11 of the Sale of Food and Drugs Act, 1899, which requires cans to be labelled, applies only to cans containing condensed milk.

This was a case stated by the justices of Essex on the hearing of an information charging French, the appellant, with refusing to sell to an inspector under the Sale of Food and Drugs Acts a quantity of new milk which the appellant was exposing for sale in a certain street. The proceedings were under Section 17 of the Sale of Food and Drugs Act, 1875.

It appeared that on the occasion in question the appellant was carrying three cans of milk to his barrow in the street. The inspector demanded a pint of new milk from a particular can. The appellant pretended to draw such milk and deliberately upset all the milk into the road and said, "I was not going to give you skimmed milk for new." The appellant had not, in fact, sold any milk at all from this can. The can was not labelled. The appellant alleged that the milk in the can was skimmed milk, which he was about to deliver to persons who were regular customers for skimmed milk, and he gave their names, and the justices were satisfied that he had such customers. The justices, however, held that the appellant had refused to sell a sample of milk from the particular can to the inspector, and they convicted.

For the respondent it was contended that by Section 11 of the Sale of Food and Drugs Act, 1899, the can ought to have been labelled as skimmed milk, and as it was not so labelled the milk must be presumed to be new.

The Court allowed the appeal and quashed the conviction.

LORD ALVERSTONE, in giving judgment, said there was the strongest ground for suspicion, but that was not enough. There was not any evidence

that the appellant was exposing this particular milk for sale as new milk. The appellant's act may have been foolish, but it did not prove guilt. Section 11 of the Act of 1899 did not apply to milk carried round for sale in an ordinary can, but only to condensed milk.

JELF and A. T. LAWRENCE, J.J., agreed.

CONTRAVENTION OF THE CHOLERA REGULATIONS.

At Tower Bridge Police Court on August 4th, before Mr. Baggallay, Peter Omero, master of the steamship *Irkutsk*, belonging to the United Shipping Company, Ltd., of Fenchurch Street, E.C., was, at the instance of the Port of London Sanitary Authority, fined £20 and costs for wilfully neglecting to obey a notice requiring that none of the passengers were to be allowed to leave the steamer until their addresses had been verified and permission to disembark given in writing.

In support of the summons it was stated that the vessel arrived in the Thames from St. Petersburg. In the latter city there had been a serious outbreak of cholera. At Gravesend the medical officer for the Port of London Sanitary Authority gave the master a notice, as required by the Local Government Board, stating that the passengers were to be detained until their addresses had been verified. When the ship arrived at Cotton's Wharf, however, it was found that the nine passengers had left. As the ship came from St. Petersburg, it was obvious that the passengers should not be allowed to leave until their addresses had been verified. The master afterwards wrote a letter in which he stated that he had evidently misunderstood the directions of the medical officer. He asked the doctor if "it was all right" with his passengers, and the doctor answered "Yes." He did not read the footnote on the notice stating that the passengers were to be detained. He was sorry, and tendered his apology.

For the defence it was submitted that the defendant did not "wilfully" allow the passengers to leave. They left through a misunderstanding.

In fining the defendant, Mr. Baggallay said: "It does not matter what conversation passed with the doctor. A formal document was handed to the master stating that the passengers were not to be allowed to leave. The defendant has made several voyages between St. Petersburg and London, and he detained a lady the last time on an order. The Port of London Authority would have been lacking in their duty if they had failed to bring this case into Court. We do not want cholera in England, and this is one way of keeping it out."

UNWHOLESOME MEAT.

South-Western Police Court on July 16th, before Mr. de Grey, Messrs. S. Frost & Co., provision merchants, having forty shops in various

parts of London, were summoned for depositing unwholesome meat at their Battersea depôt, and also for selling sausages containing boric acid.

Mr. Caudwell, who prosecuted for the Battersea Borough Council, said that an inspector visited the depôt and seized six joints and several pieces of cut meat as being unfit for human food. The meat was taken before the magistrate and condemned. The use of boric acid was injurious to health.

The company's secretary said the acid was put into the sausages without their knowledge. The unwholesome meat had been put aside for destruction.

Mr. de Grey said that to all appearances the cut meat was intended for sausages. He ordered the defendants to pay penalties amounting to £29 and the costs.

At Clerkenwell Police Court, on August 3rd, Thomas Gent was fined £50 and costs for exposing for sale 829 lbs. of beef and mutton unfit for the food of man.

CORRESPONDENCE.

The Editor does not accept responsibility for the opinions of correspondents.

CORRECTION.—The heading of letter published on page 432 (August number) should read "Griess Test for Nitrites."

THE PROVISION OF CLOTHING AND FOOT-GEAR FOR SCHOOL CHILDREN.—There are at present several voluntary agencies by which children with inadequate clothing and foot-gear are provided with a suitable outfit. The Education Committee controls the "Tindal Robertson Boot Fund" for the provision of boots for poor children, while the fund originated by the Brighton police for providing complete outfits of clothing and foot-gear is in every way a great help to parents of the poorer classes. From the latter fund 804 children have been thus equipped during this present season; the scheme, however, extends further than this, since deserving children on leaving school are given suitable outfits for the position which they intend to take up. This is of especial value with regard to girls, many of whom cannot go out to service because of the ragged condition of their clothes. The Children's New Year Boot Fund, controlled by Alderman Carden and a committee, provides a great number of children with boots; it is a voluntary association. The parents contribute in some cases to the payment for boots. A certain number of children are provided with clothing by the Salvation Army officers.—*Annual Report of Dr. Duncan Forbes, Medical Officer of Health, Brighton.*

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856.

RECONSTRUCTED 1888.

INCORPORATED 1892.

PROVINCIAL MEETING.

THE ANNUAL PROVINCIAL MEETING of the Society was held in the Town Hall, Ripon, on Saturday, July 24th, 1909. Present: Dr. Edward Sergeant (President), Drs. H. Cooper Pattin, J. R. Kaye, W. Arnold Evans, W. A. Bond, M. K. Robinson, J. S. Cameron, J. Priestley, F. E. Fremantle, J. B. Wilkinson, Herbert Peck, A. Greenwood, W. M. Hamilton, R. V. Clark, G. R. Green, W. R. Smith, Josephine Coupland, Elizabeth N. McVail, Herbert Jones, D. L. Williams, E. H. Snell, T. Adam, Andrew Smith, J. Buck, E. W. Rees-Jones, John Knight, Wm. Archibald, J. A. Hargreaves, S. Agnew, G. H. Pearce, W. Habgood, G. B. Buttery, F. W. Martin, J. S. Tew, Thomas Orr and Mr. W. Whitaker, F.R.S. The following visitors were also present: The Mayor of Ripon (Councillor Bower), the Town Clerk of Ripon, Mrs. and Miss Cameron, Mrs. Kaye, Mrs. Wilkinson, Miss Smith, Mrs. Herbert Peck, Miss D. M. Jones, Miss M. Jones, Mrs. Martin, Mrs. W. A. Bond, Mrs. Joseph Priestley, Mrs. G. W. Rees Jones, Professor Kendall, Miss Marjorie Sutcliffe, Mrs. Pearce, Miss Stuart, Mrs. Buck, Alderman Garsden and others.

THE MAYOR OF RIPON, in welcoming the Society to the city, referred to the great loss which the inhabitants had sustained in the death of the late Marquess whose kind and hospitable disposition was displayed in the invitation extended to the Society to visit Fountains Abbey. He said it would be particularly interesting to those present to know that in addition to other antiquities of Ripon there were signs of some sanitary authority in very remote times. "The Towne Book of Rippon," which was compiled in 1598, in the reign of Elizabeth, purported to deal with the duties of the Wakeman, an officer whose authority existed so long ago as (or even before) the Conquest. Very little appeared in the book with respect to sanitary provisions, but it was curious to find that the Wakeman for the time being "shall not flit out of the town . . . except God do visit the town with pestilence," and he was also required to make a yearly search to view who had made sufficient provision of fuel for winter. Every inhabitant "lacking the same" was punished. Forfeits were provided for not letting hedges or ditches be open at the usual times, though this might refer to land ditches rather than to drains of habitations. Penalties were levied for putting scabbed horses or mares on the commons and for failing to keep swine

either in the owners' "severalities" or in charge of a swineherd. For the swineherd two dinners were provided each year. In 1831 there was a meeting in the Town Hall, when it was decided to establish a Board of Health as a precaution against cholera, and in 1854, when there was a cholera scare, five or six deaths occurring from the disease, the Public Health Act, 1848, was adopted. Their sewage farm was looked upon as a model one, and in other directions the sanitary condition of the town was excellent. The spa was attracting a large number of visitors and no doubt one result of their visit would be still greater popularity for that institution. He concluded by expressing his thanks to Dr. Kaye for extending invitations to some of his friends to join in their excursion.

THE PRESIDENT, in moving a vote of thanks to the Mayor for his interesting address, for his hearty welcome, and for his hospitality, said that they all appreciated very much indeed their visit to the ancient city of Ripon. They had all heard so much not only of the Cathedral and of the quaint customs of the city, but also of the admirable sanitary condition of the town, and of the fame of the Spa, which was placing Ripon in the first rank of British watering-places.

PROFESSOR W. R. SMITH, in seconding the motion, assured the Mayor that they appreciated to the full the welcome and hospitality which had been extended to them.

DR. M. K. ROBINSON, referring to the large amount of money which the Corporation had spent on the Spa, said that of all the Spas in that neighbourhood he always preferred to stay at Ripon, if only on account of the delicious soft water. He considered that Ripon had a future before it, and he hoped that their visit would be one means of making the Ripon water more known and appreciated throughout the country. He did not know of any more charming place to stay at than Ripon.

DR. KAYE spoke in support of the motion, which was carried with acclamation.

The Mayor then vacated the chair, which was taken by the President. The minutes of the meeting held at Glasgow on June 27th, 1908, were taken as read, approved, and signed as a correct record of the proceedings.

The following candidates were balloted for, and declared duly elected:—

AS FELLOWS.

Gilbert Edward Brooke, M.A., L.R.C.P., D.P.H., Port Health Offices, Singapore; J. Lockhart Livingston, M.D., Hursley, Winchester; Reginald Maples, L.R.C.P., M.R.C.S., Kingsclere, Newbury; F. H. Maturin, M.B., B.C., Lymington, Hants; John Rendall, F.R.C.S., L.R.C.P., Lymington, Hants.

AS AN ASSOCIATE.

Arthur Douglas Crofts, L.R.C.P., M.R.C.S., 26, King's-road, Windsor.

A large number of candidates were nominated for election.

THE PRESIDENT referred to the success which had attended the Health Congress which had just been concluded at Leeds, and expressed the opinion that the principle of a joint congress would be in accordance with the views of most of them, and was of opinion that a resolution embodying this principle should be passed if possible.

It was pointed out that before such a resolution could be proposed the bye-laws would require to be suspended. No one dissenting, it was resolved, on the motion of **DR. FREMANTLE**, seconded by **DR. HAMILTON**, "That the bye-laws be suspended."

It was then proposed by **DR. COOPER PATTIN**, seconded by **DR. MARTIN**, and after some discussion resolved, "That as the result of the successful Congress at Leeds, it is the opinion of the Society of Medical Officers of Health that the principle of combined congresses should be maintained."

Instructions were given for a copy of this resolution to be sent to the persons concerned.

Before the formal meeting of the Society the members and their friends visited the Ripon Cathedral, where they were met by the Dean of Ripon, the Hon. W. H. Fremantle, who gave an interesting address on the history of the Cathedral, and subsequently pointed out its most remarkable features.

After being hospitably entertained by the Mayor, an excursion by motor-car was made to Studley Park and Fountains Abbey. The Medical Officer of Health for Ripon, Dr. G. R. Green, charmed all those who were present with his graphic description of the ruined abbey. After tea had been partaken of, he was accorded a hearty vote of thanks on the proposition of Dr. Cameron and Mr. W. Whitaker, the latter declaring that in Dr. Green they had re-embodied one of the monks who long ago had lived in the abbey.

On the motion of Prof. Smith and Dr. M. A. Robinson, the thanks of those present were unanimously tendered to Dr. Kaye for the very great success which had attended the meeting. There is no doubt that it will long be remembered as one of the pleasantest and best arranged gatherings which the Society has organised.

NOTES ON RIPON.

By **DR. G. R. GREEN**, Medical Officer of Health, Ripon.

RIPON is situated in the West Riding of Yorkshire, on the western edge of the fertile plain of York, just at the junction of the River Skell with the Ure. Its altitude is 120 feet above sea-level, and the soil is gravel and sand. The surrounding district is undulating and well wooded, and close at hand are Studley Park and Fountains Abbey—the largest and most interesting monastic

ruin in the country. A few miles to the west are the lofty moors, part of the Pennine Range, and to the north are the Hambleton Hills and the North Yorkshire moors.

The sulphur water, which was brought down to the city from its source at Aldfield Spa, in Skelldale, three and a half miles distant, in 1903, had been for many generations held in great repute.

The climate of Ripon, though not relaxing, is mild compared with many places in the north, owing largely to the dry and porous nature of the soil.

The city has a complete and modern system of sewerage, and the sewage farm has been pointed out by the Inspector of the Rivers Conservancy as a model of what such a farm should be.

There is an excellent water supply of pure soft water from Lumley Moor reservoir, six miles distant.

The average rainfall for the past ten years is 27.44 inches.

The Cathedral, though not large, is interesting, especially to archaeologists, every style and period of architecture being represented, from the Saxon crypt, the remains probably of the church built by St. Wilfrid in the seventh century, to the Perpendicular style in the naves and aisles.

The first charter of incorporation was granted to Ripon in 886 by Alfred the Great, the chief magistrate being then termed the Wakeman. This official caused a horn to be blown at the Market Cross at nine o'clock every night, when all good citizens had to draw bolt and bar, after which he was responsible for law and order in the city. This custom has been carried on ever since Saxon times, and the City Hornblower still nightly performs his functions on a huge horn at the Market Cross. The curfew still rings also every night at nine o'clock.

There are many other old and curious customs in this ancient city, among which may be mentioned the feast of St. Wilfrid, which commemorates the saint's triumphant return in the seventh century to his native place after his successful appeal to the Pope against the indignities which had been put upon him by the Saxon king. Every year on the Saturday preceding the first week in August, a man dressed up in full canonicals to represent St. Wilfrid parades the city on a white horse led by a monk and accompanied by a band, and the week after that is kept as a holiday by all the citizens.

Northern Branch.—An Ordinary Meeting of the Branch was held in Newcastle-on-Tyne on June 25th, the following members being present, viz.:—Dr. A. Smith (Chairman), Drs. Renney, Kerr, Hislop, Foggin, Willis, O'Brien, and Tavor.

Dr. Hislop, Medical Officer of Health, Tyne-mouth, was elected a member of the Branch.

Certain resolutions from the Society were considered, and the Branch resolved that—

- (a) The Branch agree to afternoon meetings of the Society provided such meetings do not interfere with afternoon meetings of the Council or of Committees of the Council;
- (b) The Branch agree to lending of books from the library on proper conditions, and that the cost of transit both ways be paid by the borrower;
- (c) The Branch agree to the provision of a veterinary service, provided the Veterinary Institute act in strict collaboration with the medical officer of health.

The Branch also agreed that cowsheds be under a uniform code of regulations formulated by a Government authority.

Dr. Andrew Smith was re-elected President for the year 1909-1910.

Dr. Hembrough was elected Branch Representative on the Council of the Society.

Dr. RENNEY, Medical Officer of Health, Sunderland, gave an exhaustive explanation of the Milk and Dairies Bill and of the Tuberculosis Order of 1909. Dr. Renney welcomed the Bill as a move in the right direction, though the Bill rather weakened some of the regulations in force in Sunderland under their own private Act.

A full discussion took place by several members. The general feeling was much in favour of the Bill. It was considered that the cost of efficiently working any Act of this nature should be borne by the Imperial authorities rather than local authorities. It was believed that the expenses caused by efficient working of the Act would be an incentive for some authorities to allow the Act to become a dead-letter.

The Branch considered it of importance that the Society take such action as it considers best to further the Milk and Dairies Bill becoming an Act of Parliament.

Home Counties Branch.—The Annual General Meeting was held on July 14th at the Garden City, Letchworth, Herts. Brilliant weather favoured the assembly of a large company of members and friends, including Sir John Gorst, who were entertained to luncheon by the retiring President (Dr. Fremantle). The latter, in conjunction with Mr. Howard (the director) and Mr. Gaunt (the agent of Garden City), afforded the visitors every facility during the day for a complete survey of the estate.

After luncheon the members of the Branch formed a business meeting, and the following gentlemen were chosen to act during the session 1909-10:—As President, Dr. A. E. Porter, Medical Officer of Health of Reigate Rural

District; as Treasurer, Dr. H. Ashby, of Reading; as Representatives of the Branch on the Council, Dr. Meredith Richards, of Croydon, and Dr. Charles Sanders, of West Ham; and as Hon. Secretary, Dr. Sidney C. Lawrence, Medical Officer of Health, Town Hall, Edmonton, London, N. The last four gentlemen had previously served the Branch in similar capacities during the session 1908-9. Indeed, Dr. Ashby has held the office of Hon. Treasurer ever since the formation of the Branch on August 24th, 1894.

The meeting also dealt as follows with three matters referred to the branches for an expression of their views:—

1. The subject of veterinary inspectors and cowsheds was deferred for consideration until the first ordinary meeting of the new session.

2. The suggestions of fixing the ordinary meetings of the Society at an earlier hour and providing a "mess" thereat were approved by the Branch.

3. The general feeling of the meeting was averse to the suggestion of lending books out of the Society's library to members. It was recalled that the Home Counties Branch had given £50 to provide more books for this library, and it was unanimously resolved that the Council be informed that this Branch suggests that an arrangement should be arrived at by the Society with Mr. Lewis, of Gower-street, W.C., which would be convenient to members who desire to borrow books on Public Health subjects.

ANNUAL DINNER.

The Annual Dinner of the Society will take place at the Criterion Restaurant, Piccadilly, W., on Friday, October 8th, 1909. Ladies are to be invited as guests. Early application for tickets is desirable to Dr. Priestley, Lambeth Town Hall, Brixton Hill, S.W. (Single, 7s. 6d.; double, 15s.—without wine).

HOW NOT TO MILK.—A cowkeeper, with sleeves up to expose dirty arms, went down the back of a row of cows, took up the dung with a shovel and emptied it into a barrow, threw down the shovel and pushed the barrow off to one end of the shed. Then (with filthy hands) he proceeded to the dairy, obtained a milk pail and stool, sat down alongside one of the cows, took up some well-used dirty straw, rubbed the hind legs with it, and then used it for wiping the cow's udder and teats before throwing it down again. Finally he sat up, rubbed the palms of his filthy hands together, then applied them with friction to the sides of his dirty trousers, and without further consideration proceeded to draw milk from the cow. Under such conditions can it be wondered that the milk often contains filth?—*Annual Report of Dr. Henry Armstrong, Medical Officer of Health, Newcastle-on-Tyne.*

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