

PUBLIC HEALTH.

THE JOURNAL

OF THE

Society of Medical Officers of Health.

EDITED BY

G. F. McCLEARY, M.D., D.P.H.,

Medical Officer of Health, Hampstead.

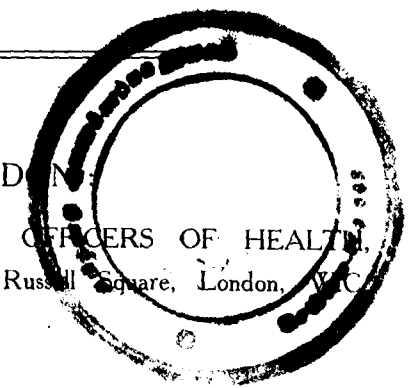
Volume XXI.

FROM MARCH, 1908, TO SEPTEMBER, 1908.

LONDON:

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

1, Upper Montague Street, Russell Square, London, W.C.



PREFACE.

THE editorship of PUBLIC HEALTH has changed hands during the Session which has just closed, and the thanks of the Society are due both to the late and to the present Editor for having maintained the deservedly high reputation of the Journal.

Following Dr. Allan, who so ably acted in that capacity for some years, Dr. Newsholme quite lately undertook the work for a second time, but on his appointment to a high post in the public health service he had to sever his connection with the Journal. While regretting this severance, the Society has reason for congratulation in having secured the services of Dr. McCleary as Editor, a fact which all who have studied the recent issues of PUBLIC HEALTH must recognise.

The laborious work of editing such a Journal must absorb much time which otherwise might be devoted to relaxation from responsible official duties; we must not, therefore, forget that we are greatly indebted to those who so generously devote their spare time and energy to this work, and this is a fitting opportunity for expressing our indebtedness.

The Session which has closed will be remembered because of the important measures which have been added to the statutes under which we work, and many valuable and helpful articles have appeared in PUBLIC HEALTH bearing upon the new administrative duties which have been placed upon us.

Among these perhaps the most important to us at the present time are articles and papers dealing with the organisation of the machinery for putting into operation the medical clauses of the Education (Administrative Provisions) Act, 1907.

Fortunately the Board of Education have seen the wisdom of advocating the closest co-operation between local public health authorities and education committees in the administration of the Act, a policy which the Journal has consistently supported.

Among other questions of the highest importance to the public health which have been ably dealt with in the columns of this volume may be mentioned papers and articles relating to the prevention of tuberculosis, the causation of cancer, infantile mortality, school hygiene, the control of food, milk, and water supplies, the purification of rivers, and the housing of the working classes.

Happily up to the present time we have found men of high standing and wide experience who have been willing to occupy the editorial chair—long may we have this good fortune.

GEO. REID,

President of the Society of Medical Officers of Health.



69088:

OL
L 15 m 56, MEE

MEE-21

Public Health

THE JOURNAL OF THE

Incorporated Society of Medical Officers of Health.

No. 1.

MARCH, 1908.

VOL. XXI.

THE OFFICIAL SCHEDULE OF MEDICAL INSPECTION.

SCHOOL HYGIENE, long so strangely neglected in the pioneer country of public health reform, has now become the question of the hour. Events have followed rapidly since the Education (Administrative Provisions) Act, 1907, was placed upon the Statute Book. The creation of the Board of Education's medical department; the Board's Memorandum on the medical inspection of school children—happily described by Dr. Alfred Greenwood as the "Children's Charter of Health"—and the recent schedule of medical inspection, mark the most important stages in the great development of school hygiene which has taken place in this country during the past few months. The schedule, which, with its accompanying circular, is printed in full in the present number of this Journal, is a document of first-rate public health importance, and it will undoubtedly be the subject of much keen discussion during the preliminary stages of the work of medical inspection.

It is not given to human powers to frame an important administrative scheme that shall be exempt from criticism, and the Board of Education can hardly expect their schedule to command immediate and universal approval. But it will not, we venture to think, be denied that the schedule is a thoroughly practical document; and, bearing in mind the special objects for which it was issued, it is not easy to see in what respects it could materially be altered for the better. Those objectors who regard the schedule as requiring too much information would find it hard to suggest any definite omission that would not seriously impair the practical utility of the inspection; while to those who, on the other hand, would demand more information than the schedule requires,

it may be said that the Board regard their scheme as "constituting the *minimum* of efficient medical inspection," which, we gather, may be amplified "in suitable districts." The Board are careful to explain, in the circular that accompanies the schedule, that the object they have in view is not an anthropometric or statistical survey, but a practical method for acquiring the information necessary to determine "the fitness of the individual child for school life, to guide the authority in adapting education to the peculiarities or abnormalities of the child, and to prepare the way for measures for the amelioration of defects in the child or its environment." What education authorities are required to do is to conduct a medical *inspection* of the children committed to their charge, and it is only in the case of physically or mentally abnormal children—whose condition will, as a rule, be indicated by such inspection, and who, after all, form a minority of the whole—that a medical *examination* will be necessary; and for the purposes of this work the schedule constitutes a comprehensive scheme of inquiry. Obviously the inspection of healthy school children will not call for the use of the whole schedule, as some have assumed; and experience has proved that in most cases the time occupied should not be more than a few minutes for each child.

In view of the important duties which the recent development of school hygiene now imposes upon medical officers of health, the Society have thought it desirable to enlarge *Public Health*, in order to provide for the insertion of additional matter relating to that subject. It is to be hoped that those who are engaged in this most important branch of public health work will take advantage of the opportunities thus afforded, and will make the columns of this Journal the medium for communicating to their colleagues the results of their experience in the work of school hygiene.

ANNOTATIONS.

TWO MILK-BORNE OUTBREAKS OF TYPHOID FEVER IN MASSACHUSETTS.*

DURING the month of September, 33 cases of typhoid fever occurred in Somerville and 28 in Cambridge. Investigation by the State Inspector of Health of District No. 6 revealed the following facts. Of the 61 cases, 43, or 70 per cent., occurred within the period 19th September—1st October. Of the 33 Somerville victims, 26 were seized in quick succession after 20th September, and all of these, as well as 1 who came down on 5th September, and 6 of the Cambridge victims, obtained milk, directly or indirectly, from the same dealer, who sold part of his night supply to other Cambridge dealers upon whose routes scattered cases of the disease occurred. The first case on this man's route in Cambridge, and the first on his route in Somerville, appeared at about the same time.

Investigation of the dairies from which the milk supply was derived revealed the fact that to one or more of them were sent cans from a place where milk was bottled and cans were washed by a man who was nursing a person who had been stricken with typhoid fever early in September. He was uncleanly in his habits and very careless in his work, some of the cans which he "washed" being strong-smelling and partially lined with sour scum. It is most likely that infective material from the person whom he nursed was conveyed by his hands directly into the cans and into the milk. This outbreak emphasizes the necessity of strict cleanliness on the part of all who handle milk, and of prohibiting the handling of milk by anybody coming in contact with persons suffering with any of the communicable diseases.

* * *

Early in November typhoid fever made its appearance in Bondsville, and by the end of the month the number of cases reported was 17. Across the river, in Belchertown, 4 cases were reported.

All of the 21 victims were supplied with milk by the same dealer, C., a resident of Belchertown. C. produced part of his supply, and secured the rest from two other farmers, G. and S. That which came from G. was not delivered at any of the houses where the cases occurred, and hence may be excluded from consideration. That supplied by S. and that produced by C. were mixed, and the mixture was delivered at these and other houses.

It was learned that one of the first cases reported in Belchertown came at the same time as the first case in Bondsville, namely, the first week in November, and that the victim was one of C.'s children. It was learned, too, that it was the custom in C.'s family to use in the household such milk as was left after each delivery. The child's case and the first cases in Bondsville were co-incident, and hence, unless the child had been ill some days without being conscious of it, they could hardly stand in the relation of cause and effect. No other case occurred in C.'s family, and none was reported from the house of S. On inquiry, however, it was brought out that beginning 7th October and until 13th November a son of S. was too sick to work, and complained of "trouble with his stomach" and "weakness." The attending physician did not treat the case as one of typhoid fever. The per-

* From the *Monthly Bulletin* of the Massachusetts Board of Health, October and November, 1907.

son who took care of the son attended also to milking the cows and handling the product, 20 quarts of which were delivered daily to C. The premises of S. when visited shewed a general condition of filth which is unfortunately not rare, and the person who had acted as nurse and milker shewed a corresponding degree of personal uncleanness. As it seemed not impossible that the real cause of the son's illness had been overlooked, and that the exciting cause of the 21 cases of typhoid fever in Bondsville and Belchertown had resided in his discharges, had been transferred from them to the milk by the hand that emptied the chamber vessel and did the milking, and thus had been distributed to C.'s customers, the son was subjected to the Widal test, which proved beyond doubt that he had had typhoid fever in what is known as the "walking" type.

NOTIFICATION OF BIRTHS ACT, 1907.†

THIS Act came into operation in Kensington on the 1st inst.; its provisions having previously been made known by the Town Clerk to medical men and midwives practising in the Borough—to many of whom, upon application, addressed and stamped notification letter-cards have been supplied. Particulars of notifications are recorded daily in a book provided for the purpose, and a weekly return of notifications is forwarded to the London County Council in a form prescribed by the Local Government Board. Between 1st and 25th January, 99 notifications were received; 6 in the first four days of the year; 13, 33, and 47, respectively, in the three weeks ended 25th January. Forty-two of these notifications were made by the fathers of the children, 20 by medical practitioners, 36 by midwives, and 1 by "another person." Twenty-nine notices of birth were received in the period covered by this report from midwives, through the medical officer of the County Council; 15, 8, 2, and 4, in the four weeks respectively. Fourteen notifications of births without the Borough were received from midwives residing within the Borough, who have been requested not to use the Council's cards except to notify births of children to residents in Kensington.

On the whole, I think there is reason to be satisfied with the working of the Act, so far. It will take time for knowledge of its existence to permeate the general public, despite the fact that its provisions have been advertised, and made known also by posters affixed to notice-boards at the churches and other places of worship. A communication has been addressed to every vicar in the Borough, and to ministers of every denomination; and the Rural Dean has been invited to bring the subject to the attention of the next ensuing chapter of the Deanery, with the view of enlisting the aid of district visitors, and others, in making the provisions of the Act known to the fathers of newly-born children, upon whom, primarily, the statutory duty of notifying births devolves.

I learn from a return prepared by the medical officer of health of the Metropolitan Borough of Bermondsey, that on the 2nd January the Act had been adopted by the Councils of fourteen boroughs—Battersea, Bermondsey, Fulham, Hampstead, Holborn, Islington, Kensington, Lambeth, London (City of), Poplar, St. Marylebone, Southwark, Stoke Newington and Woolwich; and that it had not been adopted by eleven Councils—Bethnal

† From the *Monthly Report* of Dr. T. Orme Dudfield, Medical Officer of Health of Kensington, for January, 1908.

Green, Camberwell, Chelsea, Deptford, Finsbury, Hackney, Hammersmith, Paddington, St. Pancras, Stepney and the City of Westminster. The question of adopting the Act has been postponed by three Councils—by Lewisham and Shoreditch for six months, and by Greenwich for twelve months. The Council of the Borough of Wandsworth had decided not to adopt the Act.

The sanction of the Local Government Board to the resolution of adoption appears not to have been received at present by the Council of any borough besides Kensington. It will be remembered that, by Section 6, the Local Government Board "may, by order, declare that [the] Act shall be in force in the area of any local authority who have power to adopt [it] although it has not been so adopted . . . ;" and it would appear probable that the Board are contemplating the issue of an order. The County Council, it is stated, in a report of their Parliamentary Committee (10th October, 1907) "desired that the Bill should be made compulsory in London;" but "it was understood that this view was not acceptable to the President of the Board," who, however (they add), "stated when the Bill was considered [in Committee of the House of Commons] that he believed that immediately [it] was passed all the Metropolitan Borough Councils would put the [Act] into operation [and] if any of them did not, the Board would at once impose it on them."

SCHOOL HYGIENE IN TASMANIA.*

AN exhaustive medical examination of over 1,200 children attending State schools in Hobart was carried out, with the professional assistance of Dr. A. H. Clarke, during the latter part of 1906. The results were presented in a special report. A system of medical inspection of State schools recommended in the report in question received the support of the Director of Education, and was accepted by Ministers. A whole-time lady medical inspector of State schools (Dr. Gertrude Halley, M.B., Ch.B., Melb.) and two part-time visiting medical inspectors (Dr. A. H. Clarke for Hobart, and Dr. G. H. Hogg for Launceston) were appointed under the Education Department. The work commenced in April, 1907, and has already yielded valuable results. The city State schools are visited at least once weekly, and usually oftener. The class-rooms are visited once a fortnight at least, and the children observed in their places. Teachers are instructed in simple methods of observing children for illness and serious defects, of weighing and measuring them, and of testing eyesight and hearing by the card and whisper tests respectively. New scholars and defective or weakly children are systematically examined, and advice is given to teachers concerning those requiring special consideration at school. Parents are advised by the head teacher if any serious or communicable disease or condition is discovered by the medical inspector. A sharp look-out is kept for infectious disease, to secure early exclusion of sufferers and contacts. Treatment is not given, parents being requested to apply to their own medical advisers. A simple recording system renders the observation of permanent value. These records are, of course, regarded as confidential. A large number of State schools in the country have already been visited by Dr. Halley, who has also assisted materially in the initiation of the work in the cities. The lectures on School Hygiene to teachers undergoing

* From the *Annual Report* of the Chief Health Officer of Tasmania for 1906–1907.

instruction at the Training College are now given by Dr. Halley. Special attention is paid to the hygiene of everyday school life, the object being to practically illustrate common sanitary defects of schools and simple methods of overcoming them. A series of "talks" to mothers of children has also been commenced in the city schools. Printed invitations are taken home by the children asking their mothers to meet Dr. Halley at the school after four o'clock. A short informal address is given. The main principles of child health are alluded to, and questions invited. Arrangements are being made for the women teachers from the Training College to attend one or more of these "talks." Similar work is done in Launceston schools, and the principal country schools will be included as opportunity arises. Demonstrations on the feeding and care of infants are being arranged for in the same manner, and will be commenced when summer begins. The excellent brochure on the Bertillon system of classification of disease recently issued by the Commonwealth Bureau of Statistics is in process of adaptation to the school medical inspection records. It is anticipated that by a simple process of standardisation of the medical inspector's observations, this system will prove of great service by securing greater accuracy in recording and interpreting the results of their work.

FREE DISTRIBUTION OF HARMFUL DRUGS.†

IN order to protect children and others from harm resulting from eating proprietary preparations of injurious drugs put in their way through house to house distribution of free samples, the Massachusetts Legislature of 1907 passed the following law (chapter 180):—

SECTION 1.—No person shall distribute, deliver or give away in any public street or highway or from house to house or place to place, any bottle, box, envelope or package containing any liquid, medicine, pill, powder, tablet or other article which is composed of any drug, poison or other ingredient or substance which may be in any way injurious or harmful to any child or other person who may taste, eat, drink or otherwise use the same.

SECTION 2.—Whoever violates the provisions of this Act shall be punished by a fine of not less than fifty nor more than one hundred dollars. [Approved March 8, 1907.]

Among the drugs which the promoters of this Bill had in mind, and perhaps more than any other, was acetanilid, the ignorant use of which has resulted in many cases of serious illness and not a few deaths.

The first prosecutions under the Act occurred on 15th November, when four men were arrested by the police and charged before the East Boston District Court with distributing, on the streets and from house to house, free samples of "Hill's Cascara Quinine Bromide for Colds and La Grippe," each tablet of which contained one and a half grains of acetanilid. Each of the defendants pleaded "guilty" and paid a fine of 50 dollars.

THE Parliamentary Committee of the Kent County Council have reported in favour of the appointment of a county medical officer for the medical inspection of children. They recommend his commencing salary be £800 per annum, the council paying all travelling and other expenses, and that he should not be allowed to hold any other appointment.

† From the *Monthly Bulletin* of the Massachusetts Board of Health, November, 1907.

SOME OBSERVATIONS UPON DISINFECTION.

By HENRY KENWOOD, M.B., D.P.H.,

Chadwick Professor of Hygiene in the University of London, and Medical Officer of Health for the Metropolitan Borough of Stoke Newington.

I SHOULD like to preface my few remarks by stating that it is not my intention to monopolise your time with any attempt to deal, however fragmentarily, with the full range of matter included in the comprehensive title of "Disinfection"; and as my position here is simply that of the opener of a discussion, I shall only touch upon one or two items. I am sure that this will meet with your approval, for time is short, and we are all anxious to benefit from a general discussion.

From the standpoint of the municipal practice of disinfection it may be stated without fear of contradiction that the past few years have witnessed a levelling-up tendency. The various methods of procedure adopted have been characterized by a slowly diminishing range of variety and a more scientific appreciation. If less disinfectant is used in some cases than was formerly the case, the loss in quantity has been compensated for by a gain in quality and the restriction of the use of the agent to the attainment of an object which is attainable. Thus, the employment of a large amount of comparatively worthless disinfectants and the unscientific use of otherwise serviceable agents is growing less and less, and it appears probable that the near future will witness a further advance.

But still, I find, after examining a large number of tender forms issued by sanitary authorities, that the majority call for no statement of the germicidal values of the agents, and often no demand is made that samples should be submitted for testing purposes. Some only name the disinfectants they desire, and submit a list which does not always show a happy selection; and with others only the percentage of recognised disinfectants contained in the agent tendered for has to be stated. Others require a guaranteed germicide efficiency, as determined by the Rideal-Walker method, and also that the agent is homogeneous and miscible with water in all proportions; of these some require a co-efficient with regard to *Staphylococcus pyogenes aureus* as well as *B. typhosus*; and others simply ask for the germicidal value without specifying any particular

method of procedure. His Majesty's Office of Works requires that the proprietor should submit the agent to the Lister Institute for bacteriological standardization, and he is asked to pay the fee of the Institute (6 guineas).

There is no doubt that many disinfectants now upon the market are, for most purposes, several times more potent than the carbolic acid which was formerly so generally employed, but a satisfactory standardization is essential to their more scientific and less haphazard employment, and it will tend to eliminate the quackery which is still associated with their sale. It would be well in this country if we took a page out of the book of the State of Victoria, where regulations came into effect on January 1st, 1907 (under the Pure Food Act, 1905), upon the labelling of packages containing disinfectants or germicides. By these regulations it is required, under a penalty of £10, that:—

1. Any person packing or selling any substance or compound under the name or description of, or apparently with the intention that the same may be used as a disinfectant or germicide shall, in or on any label attached or affixed to any package containing such substance or compound, set out explicit information and directions as to—

(a) the strength or proportion, and the manner in which such substance or compound must be used in order that it may act as a disinfectant or germicide;

(b) any matter, or condition, or circumstance, in the presence of which the disinfecting or germicidal effect of such substance or compound is counteracted or rendered inoperative, or is interfered with.

Hitherto the problem of how to introduce into a standard bacteriological test the disturbing fact that the germicidal value of all disinfectants suffers a considerable reduction in the presence of the organic matter that is invariably associated with the germs of disease, has not been solved to everyone's satisfaction, for the reason that it has hitherto been found impossible to devise a medium of absolutely uniform composition which shall serve as a universal standard and reproduce in a satisfactory manner all the possible variations of the media in which the particular germ may have to be disinfected.

I agree with Rideal that an attempt to evolve any single routine bacteriological test that could apply to the very divergent circumstances

obtaining in every kind of disinfection is foredoomed to failure. But it is certain that economy and efficiency alike demand that in the future the chief disinfecting agents shall be made the subject of such comparative tests that they may be differentiated as to their relative applicability for special purposes. Apart from the circumstance that the relative germicidal values of disinfectants vary under different conditions there are many other considerations, mainly of a chemical or physical nature, which determine their special applicability to special circumstances.

The experiments by Klein, Fowler, Meredith Wynter Blyth, Hewlett and myself amply demonstrate that the carbolic acid co-efficient obtained on the naked germ is not only greatly reduced in the presence of even small quantities of faeces, mucus or milk, but that a disinfectant having a very high co-efficient in distilled water may be of far less germicidal value than one with a low co-efficient when both are tested in the presence of organic matter.

Hewlett and I have recently performed a few experiments upon pus, and in these we checked each other's results by independent work upon the same material carried out in our respective Departments. In all five specimens of pus were dealt with, two contained a pure culture of the *M. pyogenes aureus*, one a pure culture of the *Pneumococcus*, one a pure culture of the *Streptococcus*, and one a pure culture of the bacillus belonging to the *coli* group. The method employed was to make various mixtures of certain volumes of the pus with certain volumes of disinfectant, and thus to obtain emulsions of known strength, and after ten, twenty and thirty minutes to transfer loopfuls to broth tubes. Tests were made with B.P. Phenol as the standard, potassium permanganate in 10 per cent. solution, and the others in 2 and 5 per cent. solutions, and the mixtures of pus and disinfectant solutions were usually one volume of pus to one volume of disinfectant. Potassium permanganate was found to be inefficient unless an equal volume of the 10 per cent. solution (practically a saturated solution) was mixed with the pus, and this mixture becomes a paste with the evolution of heat. For the disinfection of pus and similar matter potassium permanganate seems therefore to be out of the

question. Briefly to summarise the results it was found to require as a rule a nearly equal volume of 5 per cent. Phenol to sterilize pus in ten minutes, and much the same may be said of the other disinfectants alluded to; but if the time is extended to thirty minutes, then 2 or 3 per cent. solutions of the other disinfectants (excluding permanganate of potassium) are about as potent as 5 per cent. Phenol. Therefore, if sterilization be required to take place within ten minutes, these disinfectants, in spite of their high carbolic acid co-efficients on naked organisms, are reduced in efficiency near to the level of Phenol, but if sterilization is not required under about half-an-hour then they are from two to three times as active as Phenol—still, however, shewing a great reduction in activity as compared with that on naked organisms.

Of the various organisms included in the experiments the *Pneumococcus* was most readily killed, then the bacillus, then the *Streptococcus*, and lastly the *M. pyogenes aureus*.

Unless, then, we include organic matter in our comparative tests we do not learn the real value of any article in practice, the amount necessary to use and its comparative cost; and we have no means of gauging the extent of that margin of safety, the provision of which has been so often advocated by Defries.

It seems that two courses are open to us practical sanitarians, who have not only to practice disinfection but are morally responsible for its efficiency, namely, either to allow a very wide margin of safety after taking into account the circumstance that the naked germ co-efficients may suffer, a diminution exceeding 50 per cent. in the presence of even 3 per cent. of some forms of organic matter; or to adopt the method advocated by Hewlett and myself of obtaining carbolic acid co-efficients of the particular disinfectants to be compared by adding varying dilutions of the disinfectants to a definite quantity of faeces, and after half-an-hour's exposure inoculating the suitable media—the survival, or otherwise, of the *coli* organism furnishing the basis of comparison. It is not difficult to ensure that all the experiments of each series are conducted under uniform conditions; and although the condition of any one series cannot be exactly reproduced (for faeces are too variable in composition), the co-efficients obtained, as Hewlett and I have

satisfied ourselves, shew approximately the same relative values and furnish the sort of information the practical sanitarian requires when he has to face the greatest difficulties of disinfection.

The scheme recommended by the Lister Institute for the standardization of disinfectants furnishes the kind of information we require. Phenol and *B. typhosus* are the standard chemical substance and germ respectively employed for ordinary purposes, but if it is required to determine the germicidal value of a disinfectant upon a sporing organism, such as anthrax, perchloride of mercury and *B. anthracis* are utilised. The determinations are carried out at the arbitrary temperature of 20° C. It is necessary to fix such a temperature, as we know that temperature alone exercises a considerable effect upon the germicidal value of most disinfectants, and that the effect varies considerably with different classes of disinfectants. The *Bacillus typhosus* is grown under conditions as identical as possible, in order so far as possible to keep the number of organisms employed for the test approximately constant; for any considerable variation of the number of organisms to be killed determines, in some measure, the time necessary to completely exterminate them. An interval of fifteen minutes is allowed for the disinfectant to act. This is a convenient and practical period of exposure, and we know that the time taken for a germicide to kill the more resistant of the germs present varies with different disinfectants. Lastly, I refer to the most important condition of all applying to their test, namely, that the germicidal value shall be determined in the presence of a certain amount of organic matter. For this purpose a sterilized 3 per cent. emulsion of human faeces (dried at 102° C.) is employed. Faeces dried at 102° C., ground in an agate mortar, and subsequently suspended in water and sterilized by steam at 120° C., reproduces fairly accurately one of the types of conditions in which a disinfectant may be employed in practice, and it is possible for the Institute to store a sufficient amount of this powder to last for the purposes of standardization for several years.

In this connection Meredith Wynter Blyth has shewn that milk of a given composition very closely reproduces the effect upon germicidal values that is exercised by faeces, there

being a fairly close relationship between the fat and nitrogen content of the two.

It may be argued that 3 per cent. of organic matter represents an excess of what has generally to be encountered in our practice of disinfection. But, if that statement be accepted as correct, the fact remains that so long as the maximum limit in everyday practice is not exceeded, we should make our comparative test apply rather to the more difficult than to the more easy circumstances. We are driven to this position from considerations of safety while disinfectants are sold and used for general disinfecting purposes; but it is desirable to classify the different occasions for use of disinfectants into, say, three types of conditions, of greatest, less, and least difficulty, and to obtain the co-efficients of disinfectants in regard to each of these types. In the dirty washing water from the floor of a school class-room, for instance, I found that there was 1.8 per cent. of solid matter, of which 0.7 was organic. Probably the disinfectant solution employed for such purposes would be sufficiently determined from a co-efficient obtained with 1 per cent. faeces. But when it is sought to gauge the relative values of disinfectants upon enteric stools, it is not too much to demand a co-efficient obtained in the presence of 10 per cent. faeces, in order that we may take advantage of what superiority, however slight, any one agent may then exhibit.

Our work upon relative germicidal values has served to impress the importance of certain physical properties of disinfectants. A disinfectant should either be soluble in water or should be capable of forming a fine emulsion with it; it should be homogenous in the bulk, for if it separates out on standing, it is certain that under the conditions of use the fact is ignored, and it is probable that the disinfectant value of any one part of the cask is, in practice, less than that of the whole when properly mixed. The finer the emulsion the greater will be the germicidal power of the disinfectant. This is probably due to the fact that, the interstices between the oil globules being small, relatively more of the disinfectant globules come in contact with the organism in a given time; for emulsions are in constant movement, and the oil globules may be seen under the microscope to bombard the organism. When an emulsified disinfectant is

mixed with warm water, not only is the activity of the oil globules increased, but the oil tends to form a fine emulsion; this is a physical circumstance that helps to determine the time period of disinfection, and it suggests an advantage in the use of such disinfectants in a warm condition. Organic matter in the presence of this class of disinfectants may lower germicidal efficiency, both by its chemical effect upon the disinfectant and by sheltering micro-organisms; but organic matter having no chemical action (such as charcoal) probably lowers germicidal values by favouring the running together of the oil globules and thus spoiling the emulsion, in addition to its sheltering effect.

We have also learnt that the physical conditions under which germicidal tests are made is a matter which has a greater importance than was once attached to it. I refer to the circumstance that the atmospheric temperature at which the tests are made is of material importance; of such importance, indeed, that it is not sufficient to take temperatures ranging from 15° to 21° C. It is necessary to fix a precise temperature (such as the 20° C. recommended by the Lister Institute) if strictly comparable results are to be obtained, and it is of material consequence to see that this is also the temperature of the disinfectant solutions at the time they are employed.

The methods of generating or liberating formic aldehyde are very numerous. Generally speaking, lamp methods and spray methods have been mostly adopted for public purposes in this country, and, so far as I can gather, the results in practice are uniformly favourable. A comparatively recent suggestion (Evans and Russell) is one upon which Colonel Firth, Kolle and others, have experimented with good results; and I have myself recently confirmed its efficiency from the standpoint of the disinfection of *Staphylococcus pyogenes aureus*—a fairly resistant organism. I have got results so far which indicate that the method is more efficient than the fumigation method by the Alformant lamp (25 tablets of paraform per 100 square feet of floor space), and, although it is not so economical of material, it is very simple and convenient in practice. By this method, as recommended, 142½ grams of potassium permanganate are placed in a metallic dish (which should be

about 7 ins. in diameter and from 3 to 4 ins. deep), and twice the weight of formalin is then poured upon the permanganate. After a few seconds chemical action takes place between the permanganate and about one-fifth of the formic aldehyde in the formalin, and this produces sufficient heat to evaporate the remainder of the formalin. The room is, of course, sealed up for from four to six hours. I am very favourably impressed with the method, for by it the maximum dosage of the room by formic aldehyde is obtained in far less time than by the use of paraform tablets in a lamp, and the atmosphere is so charged with steam (which carries the formic aldehyde) that all surfaces are moistened, and receive a most thorough application of the disinfectant. It seems to me to present material advantages over both the spray and gaseous methods of employing formic aldehyde for surface disinfection, and I propose to give the method an extensive trial in Stoke Newington.

I have during the past month experienced considerable difficulty in ridding a recently empty old house from fleas—a difficulty which we have all experienced at times; and I shall be interested to hear if any colleague has any suggestions to offer in connection with this branch of disinfection. The usual sulphuring was performed, the wall papers stripped and burned, and, realising that the barrel-shaped white eggs are mainly deposited in cracks in walls, floor-boards, etc., the walls were subsequently lime-washed and paraffin was applied by means of a brush to all crevices and cracks in walls and floors, behind mouldings and skirtings, and at the joints or connections of all ironwork. The services of a charwoman were requisitioned on four successive weeks for cleansing purposes, for we know that the eggs are commonly found in the dirty sweepings of apartments, and that the flea larvæ may be reared on such sweepings, and may, under favourable conditions, pass through their larval and pupal stages of development, and emerge as fleas in less than a month. This difficulty in ridding the house was so considerable that it led me to make some experiments to satisfy myself whether some of the other gaseous disinfectants available might not be more efficient than sulphurous acid. I experimented with formic aldehyde, chlorine nitrous acids and sulphurous acid. In order to obtain uniform testing conditions, about

one per cent. of these gases was generated in the atmosphere of a sealed room. A number of fleas were exposed in a small fine muslin cage for one hour, and the room was momentarily unsealed and observations taken at every quarter of an hour. I found that all the fleas (a dozen in number) and three bugs survived exposure to each of the first three disinfectants mentioned, but that bugs were killed in half-an-hour by sulphurous acid, and the same gas succeeded in killing all fleas in one hour. There can be no doubt therefore as to the special serviceability of sulphurous acid for this branch of disinfection.

Now that the hygienic needs of the school premises and of the school-child fall more within the domain of the administrative and advisory duties of the medical officer of health, the disinfection of school premises, which has been far too neglected in the past, will receive more attention in the future; for if we are to reduce school infection to a minimum, surely a little more regard must be given to this important branch of work. Hitherto, the disinfection of school class-rooms has been almost restricted to occasions of the epidemic prevalence of disease when it has largely affected the scholars of a particular school, whereas it should be undertaken at frequent short intervals all the year round. This is not the occasion on which to dilate upon the special needs of school premises, but the circumstance of crowding children together for many hours daily (these children being at the most susceptible age periods for many diseases) the difficulties of early diagnosis and the frequency of mild and "carrier" cases, sufficiently account for the large amount of school infection, and they combine to make an excellent case for more disinfection and cleansing. The suggestion that the premises should be disinfected at the close of each school week appears to advocate rather an extreme view, but it is warranted by our knowledge of the potential risks. I can conceive the bombshell effect the suggestion would produce at one school that I have recently inspected, where I learned that the floors of the school class-rooms are not once even washed between the Christmas and Easter vacations. As to the methods which may be recommended for the disinfection of school class-rooms, I would suggest that a

preliminary spraying of floors, seats, desks, etc., should be followed by sweeping and wiping, then scrubbing, and finally by a disinfectant spraying.

At a school, the class-room floors of which had not been scrubbed for five weeks, I was able to obtain permission to have a small area of flooring (about 30 square feet) thoroughly scrubbed with hot water, and the dirty water wrung out of the cloth was collected in a winchester quart bottle. The liquid, which was very dark and dirty, but not otherwise offensive, was employed for the purpose of diluting a well-known proprietary disinfectant, and thus serve to introduce organic matter into the test of its germicidal value. The experiment appealed to me as possessing a real practical value. The result was that the carbolic acid co-efficient of the disinfectant in question was reduced to 40 per cent. below the advertised figure (which is based upon a naked germ test).

The disinfection of school books is also much neglected. Yet they may be considerable factors in the transmission of infection, for all we know to the contrary. This is an item upon which more work is necessary; but the experiments hitherto performed indicate that, except when books are markedly soiled, they do not offer favourable conditions for the retention of germ life. By steeping the most soiled parts of library books for twenty-four hours in a physiological solution of salt, and rubbing the bindings with the same, the centrifugalized washings were capable of communicating tubercle to 35 per cent. of 43 guinea-pigs, whereas negative results were obtained from the cleaner books (Mitelesen and Knopf, in Berlin). The usual cupboard compartment, in which books are so disposed on shelves of perforated zinc gauze, that the pages (more especially the dirty ones) open out, or in which the books are suspended upon wires from the top of the chamber, fumigated with formic aldehyde for two or three hours, appears to be satisfactory; but if the book is an old and markedly soiled one, I believe that we should always recommend its destruction. Probably this method is as satisfactory in practice as that recommended by Kister & Trautmann, the principle of which was suggested in the first case by Dr. Symons, of Bath. In this method the books are placed in a steam disinfecting

apparatus, fitted with a vacuum apparatus; formalin is placed in a vaporiser at a point in the oven most distant from the vacuum apparatus, and as the pressure inside the oven is reduced, formic aldehyde and steam are liberated at about 80° C.; this is continuously sucked through the apparatus for thirty minutes, the books being disposed in the track of the vapours.

Spray disinfection in the hands of a careful and conscientious official is doubtless satisfactory. Given a sufficiently fine spray, it injures nothing, and there is a saving of several hours (often a most important matter) in the time during which the room is not available for occupation; but it is held by many of us that there is much in favour of the method which is less dependent upon the care and conscientiousness of the official for

collected in reference to each home disinfected, I have drawn up the following Table, regarding which no one appreciates more than I do the limitations to its value from many stand-points; but nothing more can be made of the facts as collected in the Register, and the most I claim for it is that it does not furnish evidence in favour of the superiority of the spray method of disinfection.

Enteric fever has been omitted from the Table, because in respect of this disease no subsequent infection occurred during either year of any member of the primarily infected home.

With reference to the scarlet fever cases it was found that there was an average of 3.8 living rooms to each infected family, and there was an average of 5.2 members to each such family. With reference to diph-

COMPARATIVE TABULAR STATEMENT OF FACTS ASCERTAINED DURING 1906 (FUMIGATION) AND 1907 (SPRAYING).

	SCARLET FEVER.		DIPHTHERIA.	
	1906.	1907.	1906.	1907.
Number of Homes Disinfected	125	249	41	108
Number of Persons in Infected Homes	579	1036	212	542
Number at risk	393 (about 68%)	720 (about 70%)	156 (about 73%)	415 (about 76%)
Number at special risk (under 14 years)	150 (about 25.9%)	265 (about 25.6%)	65 (about 31%)	216 (about 39.8%)
Subsequent cases in same homes during each year.	Total	11	1	15
	After 7 days	5	0	7
	From 7-60 days	5	0	6

its efficiency; and which, by requiring the room to be sealed up for several hours, involves a bombardment of the exposed germs on surfaces by the molecules of gas generated into the atmosphere. The circumstance, moreover, that the disinfecting agent is capable of passing through any fissures or spaces in and behind woodwork, to follow the infectious dust beyond, is a further advantage that has always appealed strongly to me. As to the relative efficiency of the two methods in practice, I have, during the years 1906 and 1907 endeavoured to obtain some information. During the whole of the year 1906, fumigation by formic aldehyde (alformant lamp, 25 tablets per 100 sq. feet of floor) was carried out in Stoke Newington, and during the year 1907 the infected apartments were sprayed with a 1 per cent. acid solution of corrosive sublimate. From the information carefully

theria, these averages were 4.5 and 5.6 respectively.

As regards scarlet fever, after excluding those who had previously suffered, and those whose illness led to the disinfection, it will be seen that during 1906 and 1907, 1,113 persons were at risk, and that of these 415 were under fourteen, and therefore at special risk; whereas, in diphtheria, 571 were at risk and 281 at special risk.

Therefore, the number at risk includes all those members of infected homes who had not suffered from the disease at the time of inquiry, and the number at special risk is a similar statement confined to those under 14 years of age; and I should add that whereas the inquiry-forms relating to the subsequent cases suggest in a few cases a school origin of infection, and in others the infection is ascribed to the return of a case from a fever

hospital, I have made no deductions for what are only, after all, surmises, which, moreover, form a similar proportion to the total in both years. It is impossible in practice to eliminate all the possible outside causes of infection, and to say in any case that the subsequent infection of a member of a family, of whom one had previously suffered from infection, is due to the failure of the disinfection practised. Nor can the non-occurrence of subsequent infection be taken as an absolutely final test of the efficiency of disinfection; we have to recognise that the consequences of inefficiency will depend upon the nature of the infection, the probability of its retention, the nature of the subsequent exposure by different individuals, and upon the degree of their *then* susceptibility, and it must be borne in mind that often the most susceptible material at the time is exhausted in the home by the primary outbreak of infection. Under the ordinary conditions of home life, at least among the poorer classes, it is barely conceivable that when infection occurs any member of the family escapes exposure to either the original source of the infection or to the infection given off by the infected member prior to removal to hospital; but owing to subtle circumstances that determine immunity the majority escape.

But there can be no reasonable doubt that if A uses a spray method and B a fumigation method, if A's method is superior in its disinfecting results to B, then A should be capable of demonstrating the fact by a reduced number of subsequent cases among the numerous infected households of a large community.

If there is no evidence of this in a careful investigation spreading over two years in a population of about 55,000, then I am not disposed to believe that in practice there can be a material difference in results. I conclude, therefore, that there is from the standpoint of efficiency little to choose between either method if it is duly recognised that both represent but one step of several which are necessary for the complete disinfection of the room and its contents, and that the most important of these steps are the washing down with soap and a disinfecting solution of all those surfaces on which dust (and with it the germs) can settle; and the removal of all articles into which germs can penetrate, for steam disinfection.

DISCUSSION.

The CHAIRMAN, at the conclusion of the paper, said they would all have noticed the difference between Professor Kenwood's paper and those that were read on disinfection years ago. It was this, that they were now recognising the point to which disinfection must be applied in varying diseases, the need of disinfection bearing on the nature of the disease, and the accuracy of the standard strength of disinfectants used for particular purposes. With regard to the common infectious diseases of childhood—scarlet fever and diphtheria—they now knew, of course, that much potency attached to personal infection, that much of the infectious material was carried in the person rather than remaining in the room, especially when the patient was removed early to hospital, in which case he supposed very little infection at all attached to the room. In some parts of America it was becoming the practice not to disinfect in such cases unless a highly infectious case had been detained for a long period in the room, in which circumstances disinfection became necessary. But the important point in Professor Kenwood's paper was that it fully recognised that when disinfection was applied it must be applied in proper strength, and must be directed to the material to which the infection was likely to have attached itself. He was very interested in Professor Kenwood's description of his particular method of producing Formalin, and imagined that it would prove a very practical one. There was, however, one point he did not quite understand, and that was with regard to the frequency of mild and carrier cases in schools, suggesting the necessity for more frequent disinfection of school premises. He thought it rather directed their attention to the great importance of the person in school infection, as opposed to the importance of the place. He did not wish it to be understood that he objected to the cleansing of schools and their periodical inspection, but he thought infection more likely to arise from the surfaces of the children than from the surfaces of the rooms. Still, he had been extremely interested in the paper, and he hoped it would lead to an interesting discussion, which he was pleased to say would be opened by Colonel Firth.

Colonel FIRTH appreciated the compliment of being asked to follow Professor Kenwood in the discussion of this question. They would, he thought, all agree that they had had from Professor Kenwood an extremely temperate and judicial statement in regard to a very difficult subject. It appeared to him the whole subject divided itself for discussion into a question of standards and one of methods, and, as subsidiary to the question of methods, came the further question, "Was it necessary to disinfect a room at all?" Time did not allow of his covering the whole ground adequately; but, speaking on the question of standards, he was more or less in accord with the opinions of Professor Kenwood.

Having said that, he would dismiss that part of the argument and pass to other questions. Professor Kenwood had been kind enough to refer to certain experiments that it had been his (Colonel Firth's) pleasure to make, with regard to formic aldehyde disinfection in air spaces during the last three years. The results of those experiments would be published next month. Taking an Alformant lamp he found that adequate disinfection could only be secured by using thirty-five tablets per 1,000 cubic feet when the temperature was below 50° F., and the humidity under 70 per cent.; if the atmosphere was saturated, twenty-five tablets per 1,000 cubic feet were efficient. Calculating out the amount of active formaldehyde that had been generated from the tablets, he recovered practically 33 per cent. in the atmosphere after an hour. As a result of other experiments, he found that after using a "Torrent" generator, 39 per cent. of the formaldehyde was recoverable from the air; after using a "Lingner's" lamp rather more than 40 per cent. was recoverable; while with a "Trenner-Lee" generator 41 per cent. was recoverable. In place of using formalin, if paraform tablets were crushed and dissolved in boiling water, and then evaporated by any one of the above-named three generators, some 27 per cent. of formaldehyde was recoverable in the air. It was notable, in the course of his experiments, what good results were obtained on a still day as compared with a day when there was a stiff breeze blowing outside; and this had a practical bearing on the question, inasmuch as it shewed how impractical must be their procedure in these cases, because in disinfecting a room no consideration was given as to whether it was a dry day or a muggy day, a quiet day or a breezy day. He confirmed what Professor Kenwood had said in regard to the use of formalin decomposed by permanganate. Dr. Kenwood had referred to the difficulty experienced in Stoke Newington in ridding an empty house of fleas. It so happened that he (Colonel Firth) was doing duty at Aldershot, and had experienced difficulty in the extermination of lice. None of these methods would kill lice, and he had only been able to deal effectively with these pests by means of the "Equifex" disinfectant. At Aldershot they often had to disinfect red coats, blue coats, green coats and coats with all sorts of different trimmings upon them, and these could not be put into a steam disinfectant without being damaged. Therefore, the system used in disinfecting these coats was the permanganate-formalin method. He had had an air-tight cupboard made, in which the coats were hung up. Then a bucket was placed underneath the coats, the reagents decomposed as explained, followed by a free generation of formaldehyde. The best results were obtained when this method was carried out inside a steam disinfectant, maintaining the temperature of the chamber at 120° F., with just sufficient steam inside to keep the air moist. Three hours' exposure was needed to kill vermin by this method. He thought the best part of Professor Kenwood's address lay in the last sentence. He welcomed the cheers that that statement had received, as it shewed

that there were more present than he had expected to find who were of the same opinion. He felt that it was time they, as scientific men, should be honest, and should drop, once and for all, this charlatanism, this make-believe, which had been going on, of disinfecting a room because a person had had infectious disease in it a few days before. He did not believe that germs hung to walls or ceilings. All infection was from man to man, woman to woman, child to child; it was personal. In this connection he was trying a little experiment. He did not disinfect at all after scarlet fever, and was not getting any more cases. The disease did not attach to the barrack-room; it attached to the men's clothing. These should be disinfected at once, and, with regard to the barrack-room, all that was wanted was hot water, soft soap, a fatigue party, and elbow grease. Why not do the same in civil life? Carefully disinfect by steam all personal clothing, and merely trust to fresh air and soap and water to cleanse the room.

Dr. RIDEAL said he had always been a strong advocate for soap and water; but Professor Kenwood, in his concluding remarks, also coupled with that the use of a disinfectant solution on all those surfaces on which dust, and with it the germs, could settle. Colonel Firth's practice of not using any disinfectant at all in the room in cases of scarlet fever might, perhaps, commend itself to Colonel Firth, and to the War Office, and possibly to other medical officers of health; but scarlet fever was not the only disease they had to consider. He doubted very much whether, in the case of a tubercular room, for example, Colonel Firth's method of relying entirely upon a fatigue party, and the use of soap and water on the floor, would ensure the removal of the tubercular organisms carried by the cough or spittle. He noticed that Professor Kenwood put forward, for the purpose of the test, the use of sterilized 3 per cent. emulsion of human faeces at 102° C. Dr. Parkes, on behalf of His Majesty's Office of Works, required that the proprietor of any disinfectant should send the agent to the Lister Institute for bacteriological standardization, for which he was asked to pay a fee of six guineas; but quite recently a most interesting lecture was given at the Lister Institute by Miss Chick, on tests which had been carried out there. She drew attention to the very important factor that all tests of disinfectants upon organisms depended upon the resistancy of the organism, its age, and the number of organisms which had to be taken into account. The Rideal-Walker test, which was used by a good many people at the present time, was put forward by himself and Mr. Walker some years ago as a method for sorting out disinfectants, and was meant to enable a medical officer of health or a corporation buying a disinfectant to see that the article ordered was obtained. As there had been some misconception about it, he would like to take this opportunity of saying that he never intended, and he was sure Mr. Walker did not, to suggest that particular process for anything further than the sorting and ear-marking of a given disinfectant, and ascertaining that the bulk was according to sample. It

was not put forward as a universal test. The surveyor of Plymouth, instead of using faeces (dried at 102° C.) ground in an agate mortar, suggested using the faeces of Plymouth, and the *bacillus coli* that existed in the Plymouth sewage; so that any unfortunate contractor who wished to supply a disinfectant fluid to the Borough of Plymouth must, according to this specification—and there was a penalty of £60 if he did not supply according to sample—produce a fluid which not only had a Rideal-Walker co-efficient, but a Rideal-Walker co-efficient in the presence of Plymouth sewage, which killed the particular variety of *bacillus coli* that frequented the Plymouth sewage. The Home Office had quite recently gone into the question as it affected the dealing with anthrax and horse-hair; but in this case the disinfectant had to be certified, not by a medical officer or by the Lister Institute, but by the director of a bacteriological laboratory. All this made the standardization of disinfection a perfect farce, and one was almost inclined to say, with Colonel Firth, that they had better not have disinfectants at all, and rely upon the soap method. Professor Kenwood had advocated the adoption of the regulations in force in the State of Victoria, upon the labelling of packages containing disinfectants or germicides. By one of these regulations it was required that the label attached to the package should set out explicit directions as to any matter, or condition, or circumstance, in the presence of which the disinfecting or germicidal effect of such substance or compound was counteracted or rendered inoperative, or was interfered with. Surely it would be much better to say in what conditions it was operative, rather than inoperative. He was of opinion that 3 per cent. of faeces was too high an amount to introduce into a standardization test for ordinary practice. He had not had any great experience of the permanganate method, but knew that there had been explosions with that method, and that there was great risk of fire. With regard to the Table at the end of Professor Kenwood's paper, the comparison there, if it meant anything, was in favour of fumigation.

Mr. WOLF DEFRIES, referring to the question as to whether or not there was any need to disinfect rooms, said that when medical science could declare the precise vehicles of infection, and the means by which they could be dealt with, then the taking of measures, such as room disinfection, which so to speak, are taken at random, might be aimless tomfoolery; but he thought Colonel Firth's warning not to continue any system of pretence in these matters applied rather to the interpretation to be given to laboratory results affecting the use of disinfectants. No safe practice could come from assuming to know more as to either the action of disinfectants or the aetiology of diseases than was actually known to the medical profession. In infectious diseases like scarlet fever, for instance, of which the exciting organism was not authentically known, it was unsafe to neglect precautions upon the mere faith of assumptions, of the truth of which there was no scientific evidence. What seemed to him most to be desired was that

operations should be regulated less by assumption, opinion and authority, and more by what could be deduced strictly from scientific facts. For that reason he rather deprecated the quasi-disparagement expressed by Professor Kenwood in respect of his own statistical table at the end of the paper. In his opinion, the application of statistical methods to the investigation of questions of disinfection was more fruitful than many others, and deserved to be much more employed, if it were always used with the reticence and temperance exhibited in Dr. Kenwood's statements. Dr. Kenwood pointed out that in this particular set of figures they had circumstances—fewness of figures, varying epidemic conditions, difference of disinfectants—which prevented any direct inference from being drawn; but it was an important step in the literature of disinfection that Professor Kenwood should put forward these figures as indicating a class of observation which deserved to be made more freely. But the chief point he had risen to submit was this, that it behoved those concerned in disinfection to draw a clear distinction between scientific work and practical application. To examine a disinfectant for use under varying conditions by adding to it, in Professor Kenwood's words, "a definite quantity" of a complex substance of varying and ill-defined composition, and then subject it to a test, which at the doubtless moderate charge of the Lister Institute entailed work to the value of six guineas per sample, was neither scientific research nor practical precaution. For the satisfactory control of disinfectants, both pure research and practical assay were necessary; but he deprecated the endeavour to attain results for which both methods were required in succession by applying a somewhat clumsy and defective and a very costly mixture of the two. He did not doubt that much more research was needed before a satisfactory standard method of assay could be set up, and would greatly like to see it undertaken by the Lister Institute, or some other competent body of men. But to be of any real use a method of assay must be such as can be practised by analysts, and must not require either the resources of a research laboratory or the amount of time which is at the disposal of its fortunate inmates. Until such a standard method was available, the safest plan was to take such simpler and well-tested method as there was, making allowance for its admitted shortcomings by allowing a sufficient factor of safety, as is done in the older and more exact arts of engineering. A standard of disinfection, the application of which, to an individual sample, would cost the local authority half the salary of a medical officer of health in some parts of the country, was absolutely nugatory for practical purposes; it could never be supplied with the constancy necessary to practical control. To introduce a pseudo-scientific standard—a standard which did not conform to the requirements of research work, and yet was too expensive for practical use—would be a retrograde step.

Colonel DAVIES said he was glad to be able to corroborate what Colonel Firth had said about the effects of formaldehyde in the form of vapour. It had been said that vaporization was the easier of

the two methods, and that, if equally effective, it would be the better of the two. As to its being the better of the two, he had doubts; as to its being the easier of the two, he also had doubts. It was not always easy to light the lamp and set the vaporization to work effectively. The previous week he had been trying, for the greater part of two days, to get up a room to a temperature of 60°. It must be remembered that they could not have a fire burning, because it was necessary to stop up the chimney, and in cold weather it was by no means easy to get the temperature up to 60°. Then they had to secure equal distribution of vapour throughout the room, which was not easily effected either. Again, the want of penetrating power in vapours had been acknowledged. Therefore, he regarded spraying as the more effectual of the two methods, provided they had an efficient sprayer.

Dr. WILLIAM BUTLER regarded Professor Kenwood's paper as the most interesting and valuable contribution they had received on the subject from the practical standpoint. The table at the end of the paper accorded with his (Dr. Butler's) experience, for he had found almost as many, if not quite as many, secondary cases in houses after the incubative period had passed as before. It might be that the explanation lay in the fact that infection did hang about premises that had once become infected. That was the crucial point, and it was one that had to be determined before they could settle the question whether or not disinfection was necessary. Frequently one found that a case of scarlet fever had been attending school for weeks, and he thought 8 per cent. of infections from that case would be rather high, even in a school. But according to the Table prepared by Professor Kenwood, they found that in a house from which they had isolated the cases, and in which they had carried out disinfection, 8 per cent. were followed by other cases. What was the explanation of that? He did not know that there was any work the Society could address itself to with more value than this question whether disinfection of houses was necessary or not. In cases of typhoid fever, of course, there could be no question as to the value of disinfection.

Dr. L. C. PARKES thought that Professor Kenwood had acted wisely in being guarded about the value attaching to his Table, for until the mathematical chances had been calculated, they could not attach a high value to statistics. He suggested that during the next year Professor Kenwood should adopt the bold attitude of giving up the disinfection of rooms altogether, taking the same class of property as he had been dealing with, and then see what the results were. The Rideal-Walker test was a great advance on what was formerly empirical knowledge, and it placed disinfection on a scientific basis; the further tests which had been made, though, perhaps, not entirely satisfactory, were an advance on the Rideal-Walker test, and he thought they might hope that progress would be made along these lines, and that in time a test would be evolved which would be satisfactory. Disinfection was always undertaken where there was organic matter

present, and he thought they ought to encourage those tests which made for practical disinfection.

Dr. SOMMERVILLE agreed as to the necessity of working out problems on standardisation of disinfectants in connection with organic matter. But no one who knew anything of exact science would hint at the possibility of obtaining results of any value whatever without considering the constitution and character of the reagents used. The standardisation of anything required the use of standard reagents. They could not proceed, even a single step, without taking possession of uniform methods and uniform reagents. As he had pointed out more than a year ago at a meeting at which this subject was discussed—and he could not see that they were very much further ahead than night than they were then—if they wanted to obtain any real knowledge regarding the subject, they must make their deductions from work done on as simple media as possible. There was, perhaps, none of these media so uniform in composition as gelatine; and of all the substances on which he had worked he had found gelatine gave the most uniform results. He thought they should work on such lines before using composite articles such as faeces, sewage, etc., no two samples of which could ever be found of the same composition. He was astounded at the suggestion of the use of faeces made by the Lister Institute. They were far, as yet, from the final acceptance of any type of organic matter for use as a standard. The so-called Rideal-Walker method was a method of putting together practically all the important factors which troubled those who worked on disinfection before the year 1903. He considered it an ingenious method of collating those more or less troublesome factors and working them out simultaneously. That was undoubtedly a great step in advance, and now they were desirous of combining this with the introduction of organic matter. He was convinced that their efforts could only reach a satisfactory end through the work done on as simple and pure bodies as could be obtained. He appealed to the few exact chemists present to support this contention, otherwise standardisation must be a farce.

Dr. F. J. ALLAN said it was desirable that they should distinguish as far as possible between the standardisation and the practical part. The question which appealed more to him was whether or not there should be disinfection. He felt that their knowledge was not sufficient to enable them to say with accuracy that disinfection did not do good. On the contrary, he thought disinfection of considerable value in various directions. It might be that after all the contents of a room had been removed for steam disinfection, that there was not much infective material left in the room. If a patient with scarlet fever was removed in the early days of illness, perhaps none at all, but disinfection of the rooms had other values in that it destroyed other organisms which might be present, and in the tenement houses in which many of their cases occurred, it was of considerable benefit to have disinfection. Leslie Mackenzie drew attention some years ago to the beneficial results which occurred from the regular disinfection of fever

wards. Patients did not have so many minor complications. M. Vallin, in a discussion at the French Academy of Medicine (reported in *PUBLIC HEALTH*, August, 1900), urged the importance of disinfection for the destruction of pneumococci, and streptococci in cases of measles, and other observations might be quoted. He agreed with Professor Kenwood as to the great importance of thorough cleansing and the use of soap and water, with or without the addition of a reliable disinfectant fluid. Such should be used after spraying or fumigation had taken place. He admitted that possibly in large barracks, with plain walls and floors, the taking away of bedding and scrubbing down was all that was necessary, for there was not much else to disinfect. It was essential to modify the method of disinfection according to the circumstances. Accidents had been reported as having occurred with the permanganate method. These appeared to have been due to the presence of foreign matter in the vessels employed. Carried out with the scrupulous care of a laboratory experiment, it was safe enough, but it was when the operation had to be done by less skilled men that explosions happened. He would recommend Professor Kenwood, in any case, to use much deeper vessels than those he mentioned. Two years ago he had tried the permanganate method, but found it somewhat expensive. He believed that equally good results could be obtained by freshly burned lime instead of the permanganate as recommended by Huber and Bickel (*Münchener Med. Wochenschrift* LIV. 36, September, 1907). A little of the formaldehyde combines with the lime, but not much is lost, and the lime left in the vessel can be used afterwards for other purposes. This method would probably be found extremely useful in country districts, being cheap, simple, and free from danger.

Mr. MEREDITH WYNTER BLYTH lamented the fact that the question of disinfection could not be worked out quite apart from the commercial side.

PROFESSOR KENWOOD replied to various points raised in the course of the discussion. He could not say that he was convinced that a lot of the room disinfection which took place was not time and money wasted; but he agreed with Dr. Butler and Dr. Allen that, at any rate, at this stage, they were not in a position to omit it. The fact that a considerable number of cases occurred in which members of a previously infected home contracted the disease subsequent to disinfection and the expiration of maximum incubation periods, was due to a variety of circumstances, of which imperfect disinfection, for all we know to the contrary, may be one. Therefore, in his opinion, there was no case for abandoning the fumigation or spraying of rooms with chemical disinfectants until we had satisfied ourselves that, despite all we could possibly do by improving our methods and our practice, no material reduction was to be noted in the subsequent cases alluded to. We had not yet reached that position. He agreed with Dr. Rideal that, for testing the germicidal value of a disinfectant for all purposes, 3 per cent. of fæces was

too high an amount to introduce into the standardisation test; but there could be no doubt that in order to gauge the relative value of disinfectants under some conditions of practice, it was far too little. He had not read Miss Chicks' paper. He had no doubt that the numbers of organisms and their age affected germicidal values; but if she made the statement that the results depended entirely on these circumstances, he considered it an exaggeration of the fact. All that Mr. Defries had said entirely fitted in with his own views. He was of opinion that the Lister Institute, which was founded for the purpose of original research, and which seemed, in addition, to have developed into a commercial institution, was a body which ought not to undertake work for firms trading in disinfectants. As to the explosive dangers, to which reference had been made, he could not conceive that it was possible, in the carrying out of the suggestions he had set forth in the paper, with reference to the use of permanganate and formalin, for anything in the nature of an explosion to occur. Mr. Wynter Blyth had referred to the combination of science and commercialism in reference to this subject. There was no doubt that a great deal of the work on disinfectants had been tinged with commercialism. He did not believe that any one who was commercially interested in any disinfectant, however scientific he might be, could approach the question impartially. The ideal arrangement would be the evolution of a standardisation scheme by a committee, no member of which should be in any way commercially interested in any class of disinfectant. He thanked them for the kind and lenient manner in which they had dealt with a rather hurriedly-written paper, and congratulated the Society on the full discussion that had taken place.

The proceedings then concluded.

CLASS HYSTERIA.—In February, 1907, an anomalous case occurred in a school class in North-East London. It is worth record, as such outbreaks are extremely rare in English elementary schools. They may be seen occasionally as outbursts of hysteria in private boarding-schools, but on the Continent they are more common. The teacher reported that a little girl in Standard II., suffering from infantile palsy of left arm, broke the right arm; she was away some weeks and returned, and within a few days three children had lost the use of their left arms, and a fourth, of a rheumatic disposition, had such severe pains in her left arm that she held it to the side and could not be persuaded to use it. The diagnosis was clear. They were, however, examined by Dr. Hogarth. Two were of Polish extraction, and all nervous children, one very ill-developed, one very affected in manner and speech, and another supposed to have heart disease. By suggestion, the children were got to move their arms freely, and the head mistress was instructed to see that they did not become paralysed again. The outbreak ended.—*Report of Public Health Committee of London County Council, 1906.*

SOME OBSERVATIONS ON AN INQUIRY INTO STILL-BIRTHS OCCURRING IN MANCHESTER SINCE 1905.*

By MARGARET MERRY SMITH, M.B., Ch.B.,
D.P.H., Public Health Department, Manchester.

THE life of a child begins nine months before its extra-uterine existence is entered on. During this time the foetus is a parasite. It is essential, therefore, that any attempt to grapple with the problem of infantile mortality should include an investigation into the influences which affect foetal life.

Comparatively little work has been done in this field. Ballantyne has led the way in research, and much of the knowledge available is due to his efforts.

The loss of foetal life in a district should at least be approximately known, and special investigation should be made as to its cause. If causes were known, remedies could be applied. A saving of foetal life would be thus effected, and the health of many survivors favourably influenced. Just as the infantile mortality rate only partially represents the results of disease during the first 12 months of extra-uterine life, so foetal deaths probably only partially represent the results of disease during intra-uterine life. There is in all likelihood in addition to the large harvest of foetal deaths, an aftermath of deaths during the first three months after birth, and an unknown number of maimed survivors.

Knowledge of the loss of foetal life in a community can be obtained through still-birth returns, where these are available, and through investigation of individual life histories of mothers.

The number of children who die under three months, as shewn in death returns, represents those born alive, but in the main, born unfit to stand the strain of extra-uterine life.

The still-birth returns available in Manchester have been used for the purpose of arriving at some knowledge of the loss of foetal life in the city, of considering the causes of this loss, and of suggesting practical remedial measures.

The results of a special investigation into some still-births occurring in the practice of midwives, and of a special investigation made

by the medical officer of health into the fate of live-born children in the district of Ancoats, have also been used.

A complete return of the number of still-births occurring yearly in Manchester is not yet available. Considerable progress has been made, however, during the last three years towards obtaining such a return.

Until 1905 the only records of still-births were the records of burial kept by the registrars of cemeteries. These are very incomplete.

The Midwives Act of 1902 requires that midwives shall notify to the local supervising authority all still-births occurring in their practice, where no doctor was in attendance.

Returns from midwives have, therefore, been received since 1905. For the first half of that year they are not complete, as the midwives were then ignorant of their obligations; but for the last two and a half years it may be taken that the number of still-births so notified is reliable.

Through the courtesy of the Parks and Cemeteries Committee, and most of the Registrars of Cemeteries in Manchester, not under their management, the Midwives Supervising Committee receives a list of all still-births registered.

Still-birth Returns for 1906.—In 1906, for the first time, an approximate return of the number of still-births occurring in the city was available. These returns represent for the year a loss of foetal life from the fifth month of pregnancy onwards.

The total number of still-births, of which there is any return, was 789. This includes 449 still-births which occurred in the practice of doctors, and 340 which occurred in the practice of midwives. Through the cemeteries returns, 658 still-births were notified—209 of these were midwives' cases. In addition to these 209 cases, 131 still-births attended by them were notified to the local supervising authority. This shews that the cemeteries' return is not a complete one, and that burials must take place in cemeteries for which there is no return.

It is probable that the actual number of still-births occurring annually in Manchester is at least 1,000, as, in addition to incomplete returns from cemeteries, there are many still-births never buried. The still-births are classified below, those occurring in the practice of doctors and midwives being shewn in separate

* A paper read at the Meeting of the North-Western Branch, November 22nd, 1907.

columns. This classification shews the percentage of live and still-born children and the still-birth rate. The still-birth rate is calculated on the returns from midwives, as these returns are very complete. It will be seen that the percentage of still-born children is in Manchester 3·5, and the still-birth rate in midwives practice is 0·53 per 1,000 of the population taken as a whole.

The percentage of still-births is highest in the township of Manchester, which includes the districts of Ancoats, Central, and St. George's; when, however, individual districts are taken in order of highest still-birth rate, they are as follows:—Bradford, Hulme, Beswick, Ancoats, St. George's, Central. Bradford and Beswick, though in North Manchester, adjoin, and have much the same characteristics as regards industrial and social conditions as Ancoats and St. George's.

In the first four districts the birth-rate is also the highest in Manchester, and in all the districts there is a high infantile mortality rate.

STILL-BIRTHS OCCURRING IN MANCHESTER DURING 1906.

Statistical division.	Live births registered.	Still-births classified from cemetery returns		Proportion per cent.			Total still-births notified by midwives.	Still-birth rate per 1,000 of the population.
		Doctors' cases.	Midwives' cases.	Born living.	Still-born to total ascertained labours.			
					Doctors' cases.	Midwives' cases.		
City of Manchester ...	18,397	449	209	96·5	2·4	1·1	340	0·53
Manchester Township	4,122	112	65	95·9	2·6	1·5	89	0·70
North Manchester ...	5,357	132	46	96·8	2·4	0·8	92	0·49
South Manchester ...	8,918	205	98	96·7	2·2	1·1	159	0·49

Still-births Occurring in the Practice of Midwives.—Eight hundred and sixty-five still-births were notified by midwives from the beginning of 1905 to the end of October, 1907.

Table compiled from these returns, giving the sex distribution and the month of pregnancy at which the foetus was born:—

	Month of pregnancy.						Not stated.
	4th.	5th.	6th.	7th.	8th.	9th.	
Males ...	—	11	37	80	79	248	—
Females ...	3	19	55	62	77	190	—
Total ...	3	30	92	142	156	438	4

It will be seen from the above table that the

mortality at full term is higher among males than among females. The returns for each year shew a similar distribution. The higher mortality is, in all probability, due to intra-natal deaths, owing to the larger size of the male foetus. The number of full-term still-born infants is slightly higher than those born prematurely.

It is, therefore, probable that 500 full-term infants die annually in Manchester, either just previous to or during birth.

Eleven thousand one hundred and twenty-nine births were attended by midwives during 1906. The percentage of still-births in their practice was 3·06. Of these, slightly more than half were full-term infants. Among the untrained women the percentage of full-term still-born infants was somewhat higher than among the trained. This was probably due to lack of skill in conducting the difficult cases.

Four midwives, who each conducted during the year less than 50 cases, had from 9 per cent. to 16 per cent. of still-births in their practice.

The midwives' returns for 1905 and 1906, and the cemeteries' returns, shew a marked increase in the number of still-born children, both full term and premature, in the second and third quarters of the year. In order, if possible, to throw some light on this, an investigation into the seasonal occurrence of deaths of premature children during the last thirteen years was carried out. The distribution, however, is not similar. The largest number of deaths occurs during the first quarter of the year. The colder weather of that time sufficiently explains this.

Average seasonal distribution of deaths of premature children in Manchester, 1891-1905:—First quarter, 87; second quarter, 82; third quarter, 81; fourth quarter, 81.

Still-births in St. Mary's Hospitals during 1905 to 1906.—St. Mary's Hospitals are the principal maternity hospital for the city. During these two years there were 1,092 intern cases of labour, and there were 157 still-births. This is a very high proportion, but it must be remembered that these cases are selected difficult ones, and that in many there was great delay before the women were sent into hospital, thus endangering the life of both mother and child.

Forceps were used in 15 cases, and craniotomy was performed in 11. There was abnormal presentations in 31 cases—15 of these being breech and 14 transverse.

There was a history of hæmorrhage in 30 cases, and of eclampsia in 15. These cases are not included in the returns obtained through cemeteries or through midwives.

Special Investigation into Still-births occurring in the practice of Midwives during the last half of 1905 and the first quarter of 1906.—During this period all still-births were investigated by myself. In many cases the children were actually seen; this, however, was sometimes impossible. In all cases, with one or two exceptions, the inquiry was carried out in the house of the patient, and the information was obtained from the patient herself, and, where necessary, from the midwife.

The accompanying table gives the sex of the child, and a classification according to whether death was ante-natal or intra-natal:—

No. of cases.		Sex of child.		Period of death.				Doubtful.	
				Ante-natal.		Intra-nat'l.		Full term.	Prena- ture.
		M.	F.	Full term.	Prena- ture.	Full term.	Prena- ture.		
1905	91	48	43	16	27	24	2	14	8
1906	70	42	28	10	27	11	—	13	9
	161	90	71	26	54	35	2	27	17

In the cases which are classified under deaths during the ante-natal period, there was a distinct history of decomposition of the foetus. All doubtful cases have been classified in a separate group.

A further classification of thirty-four of the cases of "deaths during the intra-natal period" in the above table brings out how such still-births might be prevented.

VERTEX PRESENTATION—13.

Tedious labour.	Cord round the neck.	Cord presenting.	Hydrocephalus.	Hæmorrhage antepartum.	Twin.
2	6	1	1	2	1

BREECH PRESENTATION—20.

Uncomplicated breech.	Cord round body and neck.	Delayed after coming head.	Footling.
2	1	13	4

TRANSVERSE—1.

The large proportion of deaths occurring in breech cases is noteworthy, and especially those cases where death was due to delay of the after-coming head. In some of these latter cases the midwife was not called in time to give assistance; in others, medical assistance was not sent for soon enough, or did not arrive in time to save the life of the child. In view of the above high proportion of deaths of breech cases, it is to be regretted that the Central Midwives' Board have ceased to make it compulsory for a midwife to call in medical assistance in breech cases in primiparæ. It is chiefly among breech cases that healthy foetal lives can be saved.

Deformity of the child was present in eight cases investigated; these all occurred during 1905. Hydrocephalus was present in four cases, and in one case was accompanied by spina bifida. In this case one of the living children, aged ten, had hydrocephalus.

Anencephalus was present in three cases—

- A twin; the other twin was well developed and born alive.
- With spina bifida; hydradammios was present.
- With spina bifida; the mother was mentally deficient.

Exomphalos with spina bifida was present in one case. In this case there was no abdominal wall, there was a spina bifida in the dorsal, lumbar and sacral regions, and the lower limbs were badly developed.

Dropsy of the foetus was present in one case.

The following returns show facts relative to the occupation of mothers, to the total and average number of live children born to them,

and to the number of still-births and miscarriages also born to them :—

TABLE I.—In cases of still-births occurring in the practice of midwives in Manchester during last half of 1905 and beginning of 1906 :—

Classes of occupation.	Total women.			Children born alive to women in column 1		Still-births born to women in column 1, including child under inquiry.	Miscarriages.	Percentage of still-births and miscarriages to total live births
	Primiparae.	Multiparae.	Total.	Average number				
a. Factories and workshops.	11	6	5	13	1.2	11	3	107.7
b. Other local industries.	25	5	20	99	3.9	39	6	45.5
c. Outwork at home and shopkeepers	8	—	8	31	3.9	9	1	32.2
d. Housework	117	14	103	507	4.3	187	51	46.9
Total	161	25	136	650	4.0	246	61	47.2

TABLE II.—In cases of live-born children in the district of Ancoats during the first half of 1906 :—

a. Factories and workshops.	47	15	32	121	2.57	2	3	4.1
b. Other local industries.	39	5	34	169	4.33	2	19	12.4
c. Outwork at home and shopkeepers	46	2	44	275	5.98	9	20	10.5
d. Housework.	232	25	207	1092	4.70	35	80	10.5
Total	364	47	317	1657	4.54	48	122	10.3

Although the figures in these tables are too small to permit of drawing any conclusion from them, the very high still-birth and miscarriage rate in Table I., and in the groups B, C and D of women in both tables, deserve notice. I will refer to this later. It is certain that the number of miscarriages given in these tables includes few abortions occurring before the second month. The real miscarriage rate is, therefore, even higher than that given.

These rates are considerably higher than those quoted in Edgar's book on Obstetrics, p. 391. The percentage of interrupted pregnancies under four and a half months to total full term children is 3.7; over four and a half months it is 3.2. These percentages are founded on 10,000 cases of labour treated in a dispensary or outdoor service in New York City.

Alcoholism of the Parents.—The figures obtained as regards alcoholism are of little

value. The parents themselves gave the information, so that these returns probably under-state the case considerably :—

Both parents had beer or spirits daily in	28 cases
Either parent had beer or spirits daily in	29 "
Both parents had beer or spirits occasionally in	40 "
Either parent had beer or spirits occasionally in	25 "
Both parents were abstainers in	33 "
No history obtainable in	6 "
	161 "

Occupation of the Mother during Pregnancy.

—The occupation of the mother in the special still-birth and Ancoats live-birth investigation, is given in four groups.

GROUP A explains itself; the majority of the women in this group were primiparae and were young.

GROUP B includes women employed at various small local industries, e.g., umbrella making. The majority, however, were charwomen, hawkers and rag sorters. They were multiparae, and much older women; they were also in many cases very poor.

GROUP C includes women who did sewing in their homes, or looked after a shop attached to the house, the women here were also multiparae. They were not quite so poor as those in Group B.

GROUP D.—The majority in this group were multiparae. In many cases their life was a fairly arduous one.

Married women who work in Manchester, do so to avoid starvation. They go out because the wages of the husband are too small to provide food and clothing for the family, or because he is out of work. They do not, except in very rare instances, work at outdoor employment because they enjoy doing so. Repeatedly the answer to a question suggesting such a possibility has been that they have enough to do in their own homes without other work, if it can be avoided.

The overcrowding in the still-birth cases investigated was not marked. There was, however, much poverty.

Total Loss of Foetal Life in Manchester.—It is impossible to estimate this with any degree of accuracy. We have stated that the

number of still-births is about 1,000. Ballantyne states that one pregnancy in five ends, in city populations at least, in abortion.

If this is true in Manchester, and I should think it is, there would be between 4,000 and 5,000 abortions.

In the Ancoats inquiry, the number of abortions is two and a half times as great as the number of still-births.

This would give a return of between 2,000—3,000 abortions; this is certainly too low.

Death of Infants under Three Months.—These are undoubtedly in many cases, as Ballantyne observes, delayed foetal deaths. The child is born unfit for extra-uterine life.

In Manchester there is a high death-rate under three months. The causes are chiefly those of the wasting diseases, group :—Deaths from prematurity, congenital defects and atrophy. By the end of the first month many children have died, and by the end of the third nearly all, who die from prematurity and congenital defects, and two-thirds of those who die from atrophy. Last year medical aid was called in by midwives in 224 cases (one-fifth of the total records) for the child. Half of these cases were premature or congenitally defective children.

There has been a marked increase in the deaths from prematurity and congenital defects in Manchester in the last few years.

Table shewing the number of deaths of children under 12 months in Manchester from certain specified causes for the years 1895–1904, and in 1903 and 1906. Also the corresponding figures under three months :—

Period.	All causes.	Seven zymotic diseases.	Diar-rhoea.	Pre-mature births.	Con-vulsions.	Lung diseases.	Atrophy.	Congenital defects.
Deaths under 12 months—								
1895-'04	3253	216	594	350	167	581	555	83
1905	2780	139	559	390	144	456	436	111
1906	3111	202	733	406	144	425	483	125
Deaths under 3 months—								
1895-'04	1445	18	145	342	104	141	350	?
1905	1367	11	142	384	93	113	290	90
1906	1447	19	161	403	80	99	332	112

Development of the Foetus.—During the first few days after conception, the fertilised ovum is nourished in the uterus like an ordinary bacterium. As early as the seventh day, a specialised vascular supply has been noted. Development and specialisation of the ovum

and membranes proceed with amazing rapidity. The stages of development are divided into embryonic and foetal.

The embryonic state of foetal life is a most important period of the child's existence. It ends with the formation of the placenta about the beginning of the third month.

Scientific knowledge regarding the human ovum during this period is scanty. It is held, however, that influences which later on would result in disease of the foetus, will, acting during the embryonic stage, lead to the formation of monsters or deformities.

Definite pathological changes have been noted in the chorionic blood vessels in syphilis and fatty changes have also been recorded in certain diseases; these changes have resulted in death of the embryo.

The placenta is the most important foetal organ. Through it the mother nourishes her unborn child, and the health of the foetus depends on its vitality. Little is known concerning the pathology of the placenta, but syphilis, alcoholism, and maternal diseases cause pathological processes, and these influence adversely the health of the child.

Causes of the Loss of Foetal Life.—These may be divided into ante-natal and intra-natal. The common immediate cause of the loss of ante-natal life is a hæmorrhage separating the embryo or foetus from the uterus.

It is more difficult to arrive at the real cause. Edgar gives the following list beginning with the most common cause of abortion :

- (1) Diseased endometrium.
- (2) Retro-displacement of the uterus.
- (3) Syphilis.
- (4) Kidney insufficiency; toxæmia.
- (5) Criminal interference.
- (6) Low insertion of the placenta.

It is generally believed that endometritis is the most frequent cause of abortion, but I have been unable to obtain any collection of facts on which such a conclusion is based. It is reasonable to think, however, that a diseased endometrium will not perform adequately the very specialised function required during pregnancy.

Causes of Endometritis.—One of the most frequent causes of endometritis is sepsis, especially sepsis of a mild type. The infection takes place at a full term or premature labour, and in most cases is never recognised as such. This is due to the fact that the meaning of the

symptoms, which are slight and transient, is not understood. Such illnesses are passed over as trifling, the cause being put down to bowel or breast disturbances or after pains.

It is impossible to give the puerperal morbidity rate for Manchester, which rate would represent the proportion of such mild infections.

It is certainly high at present, and was even higher in the past.

It is interesting in this connection to notice in the report for 1906 of St. Mary's Hospitals (the principal maternity hospital of the City) that the percentage of morbidity, taking as the standard that laid down as a basis for notification of puerperal fever in Manchester, at the end of 1905, was 4.5, while it was 9.2 when the standard of the British Medical Association was adopted.

The Manchester definition is:—"For the purpose of the Notification Acts, 1889 and 1899, the term 'puerperal fever' shall include all cases in which, within seven days after the birth of a child, alive or still-born, the mother shall have a rise of temperature exceeding 100.4° F. with quick pulse, maintained for a period exceeding 24 hours, without any ascertainable cause other than the puerperal state. It shall also include all cases in which, within seven days after the birth of a child, there has been the occurrence of rigor (with attendant illness) without any ascertainable cause other than the puerperal state."

The British Medical Association standard is much more strict. According to it, if a patient's temperature rise to 100° F. twice within 24 hours, excluding the first 24 hours and irrespective of the pulse rate, she is considered as a case of morbidity.

It is held that, as a rule, the morbidity rate is higher without than within a well-conducted hospital, so we may reasonably conclude that in addition to notified cases of puerperal fever there are many septic cases. Many of these are recognised as such, many are not, and it is these mild cases which are the cause of much endometritis. The number of puerperal fever cases of which there is any return, for 1905 and 1906, were 82 and 103 respectively, a number in excess of previous years.

Among poor women, all the conditions which diminish the vitality and power of resistance to infection are present.

They are generally badly nourished during pregnancy, due to lack of proper food, clothing,

fresh air and suitable exercise. Their unhygienic surroundings also help to produce the same condition.

Ignorance and laziness prevent proper personal and domestic hygienic preparations being made for the labour. Unskilled attendance is often secured for the confinement, with the result that there is greater danger of septic organisms being introduced, and through careless midwifery a greater risk of complications.

The same adverse conditions continue to influence the health of these women during the puerperium. They cannot obtain the requisite food, and they are quite inadequately provided with clean clothing.

The diseased endometrium which results from such septic infection will, at least in many cases, not permit of the maturing of a fertilised ovum. Chorionic hæmorrhages result and abortion takes place, or the ovum is badly nourished, and the child ill-developed and unfit for post-natal existence.

Gonorrhæal infection is also a cause of endometritis. The infection of the uterus generally takes place just after the labour, probably from germs in the vagina which have lain latent for some time.

Use of preventive measures is also held to be a cause of endometritis. Use of such measures is certainly on the increase.

In retro-displacements it is probable that the endometritis, which generally co-exists, plays an important part.

Syphilis may assert itself during the foetal period, or may not do so until after the birth of the child. The time it usually shews itself in intra-uterine life is the second month. It is a frequent cause of ante-natal dystrophy, and many malformations are found in syphilitic foetuses.

In three cases investigated in the still-birth inquiry the woman had been married twice. The children in each instance born to the first husband were full time living children; the children born to the second husband were all premature and still-born. The history of the father in each case pointed to syphilis.

Alcohol.—Ballantyne states in his paper, read before the Congress on Infantile Mortality, that alcohol has an evil influence upon ante-natal life, and consequently upon the life after birth also; this effect is due to changes in the maternal kidneys and in the placenta, rather than to any direct influence which the

drug has upon the foetal tissues themselves. He quotes the statistics of Dr. Sullivan, who specially investigated the reproductive history of chronic drunkards (women) in Liverpool prison. Sullivan found that of 120 female inebriates, there were born 600 children, of whom 335 (55.8 per cent.) died under two years or were dead-born, while the remaining 265 (44.2 per cent.) lived over two years. In the case of sober mothers related to the above-mentioned women, the number of dead births and early infantile deaths were only 23.9 per cent.

Criminal Interference.—Undoubtedly there is much wilful production of loss of ante-natal life on the part of mothers. This is done by drug taking and by allowing criminal interference. Drastic aperients, pennyroyal, etc., are taken. The use of diachylon as an abortifacient is on the increase. There is as yet no means of knowing how many such abortions take place, as these cases are only reported in rare instances when they go septic.

When abortifacients are taken, death of the foetus does not necessarily result. The nutrition of the child may be impaired, however, by the illness of the mother resulting from such drug taking, and it may die later on in foetal life or in post-natal life.

Successive Pregnancies.—The tendency to increased loss of ante-natal life, which occurs with an increasing number of successive pregnancies, is well brought out in Table II., Ancoats Inquiry.

Abortions and still-births tend to recur. This is well seen in Table I., which shows the very high still-birth and miscarriage rate among the women who had a still-born child.

A very interesting history is that of a woman, aged thirty-four, who had been married fifteen years. During that time she had fifteen pregnancies. The first was a six-month still-born foetus. The second was a full-term still-born child; death was probably intra-natal. The third was born alive; it died under a year. The fourth was a miscarriage, the fifth was born alive and was alive at the time of inquiry. The sixth was a three-months abortion; the seventh was born alive and living; the eighth, ninth, tenth and eleventh were all three-months abortions; the twelfth was a still-birth at eight and a half months; the thirteenth, still-born, six and a half months; the fourteenth was born alive and living; and the fifteenth was a still-born,

eight-months foetus. There is a history in this case of rheumatic fever just before marriage and another attack four years afterwards. At number twelve the perineum was torn through to the rectum, and the woman had subsequently no control of the bowels.

In another case, the woman, aged thirty-three, had had 11 children born alive and 2 still-births. Only 4 of the children were alive at the time of the inquiry.

Another case worth quoting is No. 245:—Mother, aged thirty-seven, 10 children born alive, 4 still-births, and 1 miscarriage; 6 children died in infancy and childhood due to premature birth, diarrhoea, whooping cough and scarlet fever. This woman had mitral disease at the time of inquiry. She had had pneumonia six years before her present confinement. She had a miscarriage at the time of her illness. Since that time she had had three still-born children, then twins born alive at the eighth month, then the still-born child under inquiry. This child was large and dropsical, the placenta was small, the cord thick and gelatinous. Hydramnios was present with each of these labours.

Intra-natal Loss of Life.—Deaths during birth are directly due to maternal or foetal causes; on the part of the mother, pelvic contraction or uterine disease leading to displacement; on the part of the child malformations or feebleness.

The skill of the accoucheur here plays a great part in saving the child's life.

The remedies which are at present available to arrest loss of foetal life, and ensure the better well being of the child in utero.

1. Provision of skilled attendance for women during confinement. The Midwives Act, 1902, is a valuable means of ensuring that in future poor women will secure better attendance than in the past.

2. The use of maternity hospitals for poor patients to secure for them rest and food, and hygienic conditions during the lying-in period.

These means will prevent many cases of endometritis and displacements, which are the cause of so many subsequent still-births and miscarriages.

3. The enforcement of the provisions in the Factory Act preventing women returning to work within a month after labour.

4. Education of mothers in the general hygiene of their home and person, especially during pregnancy and lactarium. This can

be done through the midwives and health visitors.

Remedies which are Required.—1. Provision of nourishment for poor women during the last month of pregnancy and first month after confinement. This to be met either by the State or by means of charities.

2. The organization on sound lines of a Thrift Fund for pregnant women, so that they will have money to meet the expenses of their confinement.

3. Education of mothers regarding the dangers of abortions, and provision for them of skilled attendance then.

4. Education as to the sacredness of human life before birth.

5. Registration of all maternity and nursing homes.

6. Prohibition of the sale of abortifacients and of the publication of advertisements and literature relating thereto.

Further knowledge of the total loss of antenatal life is urgently required. For this purpose, registration of still-births should be made compulsory. Meanwhile, returns obtained through midwives, through registrars of cemeteries, and, after this year, through the Notifications of Births Acts are, or will be, available.

Knowledge of the loss of life through abortions is just as important. As yet there is no means of knowing accurately what this loss is, and registration is not within the sphere of practical politics.

It is true, returns from the registers now kept by midwives should give valuable information where these are well kept, but more will be learnt through individual life history investigation. Most valuable information should be obtained from the proposed investigation during 1908 into live and still-births, which is to be carried out at the request of the Home Office.

Systematic investigation of cases of abortion, still-birth and deaths of new-born children, combined with scientific research work is necessary to elucidate the causes of foetal death and disease. When causes are known, remedies can be applied.

"In our arrogance," says Dr. Scurfield, Sheffield Medical Officer of Health, "we have established a society for converting the Jews. It would be more to the point if we induced the Jews to establish missions for the teaching of good motherhood in our big towns."

THE TRAINED MIDWIFE AND HER EFFECT ON INFANTILE MORTALITY.

By ALFRED ROBINSON, M.D.,
Medical Officer of Health, Rotherham.

MIDWIVES ACT (1902).

PROBABLY no Act of Parliament, with the exception possibly of the Education Act, has in recent times been so adversely criticised and discussed as this one. I believe, when properly administered, it will in future years have a most beneficial and far-reaching effect in checking the alarming infantile mortality in our large towns. Surely, with the birth rate in this country yearly diminishing, every birth is of the utmost importance to the State. The whole of the Act will be in operation by the year 1910, and some provision for the supply of qualified midwives must be made before that time, otherwise there will be few competent persons to practice the ancient art.

Up to this year there has only been one trained, certificated midwife in Rotherham. It is impossible for a properly trained midwife commencing practice to make a living during the first year or two at midwifery alone, and, unfortunately, for some reason or other, following any other occupation is not permitted in the borough.

The present generation of midwives is getting older—though they never admit being over 45—and it is very evident to me that in the near future there will be a good opening for properly trained women to take the places of the present ones, and in the course of time to make as good, if not better, incomes. If women do not recognise this they must be blind to their own interests, and there is nothing, so far as I can see, to prevent them when getting past their work, from transferring the goodwill of their practices, on a profitable basis, to themselves, in the same way that medical men buy and sell partnerships and practices.

The trained midwife possesses an educational influence that can hardly be over-estimated, and in these days when public-spirited associations are rising up on all hands to combat infant mortality, her office will be recognised as one of great importance to the State.

It will probably surprise most people that

4,000 women die in child-bed annually in England and Wales out of the 935,000 births which take place. It must also be remembered that one-half the cases of blindness in this country arise from some neglect at birth.

Then again, the extent of the evil cannot be gauged by the visible results at the time of birth; in innumerable cases pain and disease in the mother, and deformity and feebleness in the child, develop from want of skilled care at the time of confinement and the important after days.

Having shewn how necessary it is that every lying-in woman should be able to obtain the services of a competent midwife, and that, even supposing the medical profession were able to supply their place, it would be impossible for a great number of the poor to pay their fee without recourse to the Poor Law, thus taking the first step on the downward path of dependence. There is a need for some organized effort to establish trained midwives and to guarantee them suitable remuneration, such as is adopted in Switzerland and Ireland.

In the canton of Berne, for instance, the midwives are given one year's free training by the Cantonal Government, and then settle down where they like as independent practitioners. Often they are married women, or have some suitable secondary occupation. The parish pays them for destitute cases and has power to make partial help in needy ones, if circumstances make such assistance advisable, and in some cases they subsidise the midwives. Most European nations have adopted a more or less similar system and subsidise the midwives from public funds. In Ireland the Local Government Board has a somewhat analogous arrangement. Over 600 midwives are employed by the Irish Board of Guardians, but all have paid for their own training. One or more are attached to each dispensary district (Sub-division of Union). They are under the Poor Law medical officer, but are allowed to engage in private practice and to have other occupations, so long as these do not interfere with their parish work. Unfortunately, up to the present, the English Local Government Board does not sanction the employment of out-midwives by the Boards of Guardians.

The majority of midwives that at present practice in this borough are quite incapable of taking the temperature, the pulse, passing

a catheter, etc., but the returns prove that they will follow out the instructions given them, and, like Mrs. Micawber, insist on infants receiving their sustenance from "Nature's Founts," and so produce what can only be described as the sensational returns which Tables 1, 2 and 3 prove.

RESULTS IN ROTHERHAM.

During the year 1906 the Infantile Mortality for England and Wales was 133 deaths per 1,000 births. The rate in the 76 great towns (of which Rotherham is one), was 146. In Rotherham the rate was 148; the average for the last ten years being 160.

Now what has been the result of the early notification of births by the midwives practising within the borough? I have returns of full details of 923 births attended by midwives during the year 1907, with 94 deaths of infants under one year among the babies thus attended. The remainder, 910 in number, have yielded 177 deaths. These are cases attended by unauthorised and sometimes ignorant persons, who have taken no interest in the welfare of the infants. The latter number includes the births which have been attended by medical men, midwives struck off the roll, and neighbours who have been called in on an emergency. I have no means of ascertaining the number of confinements separately attended by medical men. Under any circumstances, no advice could be given to these cases.

The difference in figures is most extraordinary, and is given in a separate table.

TABLE 1.
1907.

		Death-rate per 1,000 births.
1. Cases attended by midwives in the borough	923	102
2. Cases attended by others than certified midwives	910	195
3. Total cases in the borough	1,833	148
4. England and Wales	—	118
5. 76 Large Towns (including Rotherham)	—	127

The average infantile mortality for England and Wales is 118.25 for 1907.

This difference in favour of the Rotherham midwives is most extraordinary. So far as I can see, there is no possibility of any material error in the figures, the results merely proving what can be done in preserving infant life by

the early notification of births, and steps being taken at once to feed the baby in a proper manner.

Again, in England and Wales, the number of births registered during 1906 was 934,331, the death-rate being 1 in 231 cases in childbed. Amongst 1,000 cases attended by midwives in Rotherham, the proportion of deaths has been 1 in 331 cases, a difference of rather more than one-third in favour of our midwives. The death-rate from puerperal fever was also extremely low, being at the rate of only 0.3 per cent. of confinements. Again, on referring to Table 5, it will be found that the death-rate amongst breast-fed children was only 2 per cent., whilst the death-rate from bottle-fed children amounted to 77 per cent. This fact cannot be made too widely known.

Another noticeable point has been the large proportion of breast-fed compared with bottle-fed children in Rotherham, being 11 to 1. Compared with the Lancashire towns, this is most favourable to Rotherham, as few married females between the ages of sixteen and thirty-five are engaged in occupations away from home. In Rotherham the percentage is probably under 5.

On reference to Table 4, it will be found that medical assistance has only been required by the midwives once in twenty cases. This shows what a natural process parturition is. It will be seen in Table 6 that the midwife who wins the first prize had a percentage of children lost of only 5.08 per cent. of her total births, with a mortality rate of 50 per 1,000 births; whilst the lowest on the list had a percentage of deaths of 33, with a mortality rate per 1,000 births of 333. It is impossible to assume that this difference can be the result of any accident, but must be due to gross negligence and incompetence on the part of the midwife herself. The four midwives who have been struck off the rolls during the year had the high death-rates of 33.3, 23.3, 20 per cent., against 5.08 per cent. returned by the winner of the first prize. These facts speak for themselves, and prove that the Midwives' Committee were justified in asking the Central Midwives Board to take away their certificates.

The fact that the supervising authority in Rotherham has been successful in removing four of the midwives from the roll has had a most beneficial effect on the remainder.

The returns made of births show that at least 60 per cent. of the confinements in Rotherham are attended by women.

TABLE 2.

Showing the number of cases attended by "Midwives" and "Other Agencies," together with the difference in the results.

	Cases.	Deaths.	Infantile Mortality Rate.
A. Attended by "Midwives" ...	923	94	= 101
B. Attended by "Other Agencies" ...	910	177	= 194
Total Infantile Mortality Rate, 147.			

I have no hesitation in saying that these figures can be materially improved in future years if proper supervision and encouragement is given to the midwives.

Rotherham being a comparatively small borough, it is perhaps easier to supervise midwives and their work than in a town with a larger and migratory population. This fact, perhaps, helps to explain these extraordinary figures which were quite unexpected by me.

I should also like to add that the midwives have been of service in giving us information of dirty houses and dirty tenants, thus helping us to deal with cases which otherwise could not have come to the knowledge of the medical officer of health.

In making these calculations on the results of the various midwives, allowance must be made for the different social conditions of some patients as compared with others. Like medical men, certain of these midwives have a more "aristocratic" connection than others. The best results always occur in the better-class districts.

With these facts before him, no unbiassed person can come to any other conclusion than that these satisfactory results are due to the midwives themselves rigidly carrying out the instructions given them by me, through the female health visitor, Mrs. Kemp, for the proper feeding of infants from the first hour of their existence; to the beneficial influence of breast as compared with bottle-feeding; and, last but not least, to the generosity of the Mayoress of Rotherham, in providing an incentive to those whom one might term illiterate but painstaking women, to do their best to preserve infant life.

Table 5 shows that in breast-fed children the death-rate has only been 2 per cent., whilst in bottle-fed children it has been 59 per cent. It must be borne in mind that these calcula-

tions are made in respect to babies who belong to the same age group, and that there is no difference in their surroundings, except their being bottle-fed. If this fact does not open the eyes of mothers to the importance of suckling their own children, nothing will; and the only conclusion that one can come to is that they must want their offspring to perish.

Mrs. Kemp's Report (Female Health Visitor).

"During the past year the midwives practising in the County Borough of Rotherham have shown decided improvement. Their work is more thorough, and their standard of cleanliness, both personally and in their homes, is higher. The rules of the Central Midwives Board are better understood and practised, and the sense of personal responsibility more fully developed.

"Notifications of all births are sent in to the medical officer of health within 48 hours, or if any special feature is noticed—viz., dirty houses, extreme poverty, neglect of children or home—the midwife delivers the notification personally, with a report of same. These cases are visited immediately, and steps are taken to get the evil mitigated with as little delay as possible. Where poverty prevails and the patient is unable to obtain the necessary milk and oatmeal during the lying-in period, it is supplied through the kindness of the Mayoress of Rotherham (Mrs. C. J. Stoddart), who provides a fund for that purpose, and very sincere thanks are sent to her by the recipients.

"Four women have been taken off the midwives' roll for malpractice, neglect of rules, etc., and three fully trained ones have passed the examination of the Central Midwives Board and expect to practice in the borough. Unfortunately, only two of these will be able to do so, although so badly needed. The supply of trained midwives must be determined by the possibility of the women who take up this work being able to obtain a living wage for their labour, as they are debarred from 'following any other occupation that is in its nature liable to be a source of infection,'—existence becomes a problem whilst the practice is being made.

"Nine hundred and twenty-three births have been notified. Of these, 885 have been visited, and many re-visited. Advice is given to the mothers on the feeding, clothing, clean-

liness and general management of the infant, the food required by the mother for the supply of breast-milk; the cleanliness and ventilation of the home. This advice is very well received, and, if the visit is delayed, I am generally reminded that 'they have been expecting me before.' The interest of the mothers is greater than formerly, and questions are sometimes asked which lead to very instructive talks.

The majority of children have the wrong kind of food—at wrong times and in wrong quantities. Condensed milks are largely used—often machine-skimmed—instead of fresh cow's milk. Nursery biscuits, bread, and other starchy foods are given before the infants are physically able to digest them. Children are fed whenever they cry; and, with regard to quantity, my experience is that, up to the age of three or four months, they are often over-fed, but after that time the quantity of milk given is not sufficient to support the growing needs of the child.

"It is impossible to say how far diarrhoea may be caused by the use of the 'comforter' or 'dummy teat,' but it is more or less dirty, and that apart from other reasons, condemns their use. Fortunately breast-feeding has increased in the past year, and in several cases where I have visited for the second baby since my appointment, it has been gratifying to find the mother endeavouring to suckle the infant, instead of hand-feeding as previously."

Table 3.

	No. 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 4.

	Number of cases.	Children living.	Children deceased.	Mothers living.	Mothers deceased.	Breast fed.	Bottle fed.	Still-births.	Medical help required.
1.	3	3	—	3	—	3	—	—	—
2.	1	1	—	1	—	1	—	—	—
3.	118	112	6	118	—	107	5	2	3
4.	18	17	1	18	—	16	1	—	1
5.	16	15	1	16	—	14	1	1	4
6.	68	63	5	68	—	60	3	1	4
7.	40	37	3	40	—	33	4	2	—
8.	172	157	15	171	1	140	17	6	5
9.	66	60	6	65	1	55	5	5	2
10.	44	40	4	44	—	40	0	3	5
11.	50	45	5	50	—	42	3	5	4
12.	10	9	1	10	—	9	0	1	1
13.	10	9	1	10	—	8	1	—	2
14.	100	88	12	99	1	83	5	3	6
15.	58	51	7	58	—	47	4	4	1
16.	81	70	11	81	—	67	3	2	5
17.*	25	20	5	25	—	15	5	3	No notifications sent in.
18.	10	8	2	10	—	5	3	2	1
19.*	21	16	5	21	—	12	4	2	No notifications sent in.
20.*	12	8	4	12	—	5	3	1	3
21.*	—	—	—	—	—	—	0	—	No notifications sent in.
Totals	923	829	94	920	3	762	67	43	47

* Removed from Midwives Roll.

Shewing results of 923 births attended by midwives. Infants living and deceased during a period of 11 months.

Table 5.

CHILDREN DECEASED.—METHOD OF FEEDING AND CAUSE OF DEATH.

	Number of children dead.	Breast fed.	Bottle fed.	Spoon fed.	Never fed.	Marasmus.	Enteritis.	Convulsions.	Congenital Weakness.	Inanition and Prematurity.	Bronchitis and Pneumonia.	Pertussis.	Tubercular Meningitis.	Syphilis.	Found dead in bed.	Generalised Vaccinia and Septic Intoxication.
1.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3.	6	3	2	—	1	—	1	1	1	1	1	—	—	1	—	—
4.	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
5.	1	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—
6.	5	—	3	—	2	1	2	—	—	2	—	—	—	—	—	—
7.	3	1	1	—	1	—	—	—	—	1	1	—	—	—	—	—
8.	15	3	11	—	1	—	5	2	1	4	1	1	—	—	1	—
9.	6	1	5	—	—	2	2	—	—	—	1	—	—	—	—	1
10.	4	2	—	—	2	—	—	—	—	3	1	—	—	—	—	1
11.	5	—	3	1	1	—	3	—	1	1	—	—	—	—	—	—
12.	1	—	—	—	1	—	—	—	—	1	—	—	—	—	—	—
13.	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
14.	12	—	9	1	2	—	4	2	2	2	1	—	—	—	—	—
15.	7	2	3	2	—	1	—	—	—	4	—	1	1	—	—	—
16.	11	3	4	2	2	—	3	1	1	3	—	2	—	—	1	—
17.	5	1	4	—	—	—	2	2	—	—	1	—	—	—	—	—
18.	2	—	1	—	1	1	—	—	—	—	1	—	—	—	—	—
19.	5	—	5	—	—	2	2	1	—	—	—	—	—	—	—	—
20.	4	1	2	1	—	—	—	1	—	1	—	—	1	1	—	—
Totals ...	94	17	56	7	14	7	24	10	6	25	7	5	4	3	2	1

Table 6.
SUGGESTED PRIZE LIST.

	Registered number of midwife.	Number of cases attended.	Percentage of mother living.	Percentage of children alive.	Total number of marks obtained.	Total percentage (Mother & child counting two).
1.	1993	118	100	94·08	194·08	200
2.	2144	68	100	92·7	192·7	200
3.	3914	40	100	92·5	192·5	200

The foregoing paper is the result of a scheme suggested by the Mayoress of Rotherham (Mrs. C. J. Stoddart), and the following are the conditions upon which the prizes were offered :—

COUNTY BOROUGH OF ROTHERHAM.
Midwives Act, 1902.

Conditions upon which the prizes offered by the Mayoress (Mrs. C. J. Stoddart) will be awarded :—

1. There will be three prizes, namely, a first prize of £3, a second prize of £2, and a third prize of £1, given by the Mayoress of Rotherham (Mrs. C. J. Stoddart) to the Midwives of the Borough, subject to the following conditions :—

2. The first prize of £3 will be given to the certificated midwife, registered under the Midwives Act, who, on the 1st December, 1907, has the largest percentage of mothers and children living (mother and child to count two) of those confinements attended by the midwife between midnight on Sunday, the 9th December, 1906, and midnight on Thursday, the 31st day of October, 1907.

3. The second prize of £2 will be given to the midwife who has the second highest percentage of mothers and children living.

4. The third prize of £1 will be given to the midwife who has the third highest percentage of mothers and children living.

5. To qualify for consideration in the award of the prizes, a midwife must have attended at least 20 confinements in the borough.

6. All births must be notified to the medical officer of health, at his office at 12, Frederick Street, Rotherham, within 48 hours of the birth of the child, the notification to be given upon a form to be obtained from the medical officer of health.

7. Midwives should persuade mothers to feed their babies from the breast, instead of

feeding them by the bottle. The death-rate amongst bottle-fed children is 50 per cent. higher than the death-rate amongst breast-fed children.

8. Midwives must give every attention to mothers and children, and must particularly observe cleanliness, and also instruct mothers how to attend to their children, and special consideration in the awards will be given to the condition of the babies' eyes.

9. The decision of the Mayoress in the award of the prizes will be final.

By Order,
C. J. STODDART,
Mayor.

Town Hall, Rotherham,
8th December, 1906.

THE ADMINISTRATION OF THE MIDWIVES
ACT IN LONDON.

An Extract from SIR SHIRLEY MURPHY'S Annual Report,
for 1906.

THE number of midwives giving addresses in London on the roll at the beginning of the year was 2,105, and to these 245 names were added during the year as the result of examinations held by the Central Midwives Board, bringing the total to 2,350.

The classification of the midwives is as follows :—

Possessing L.O.S. Certificate ...	1,611
„ Hospital Certificates ...	213
Passed C.M.B. Examination ...	342
Enrolled by virtue of having been in <i>bonâ fide</i> practice a year prior to the passing of the Act of 1902 ...	184
	2,350

It will be seen from these figures that less than 8 per cent. of the enrolled midwives are “uncertificated.” The proportion of these uncertificated midwives among practising midwives is, however, much larger, for it must be borne in mind that the vast majority of enrolled midwives are not practising; many of them act as monthly nurses, and many more are on the nursing staffs of hospitals. During the year, 490 midwives (or 21 per cent. of the number enrolled) gave notice of their intention to practise within the county, and this number includes a large proportion of the 184 uncertificated midwives. Four midwives died, eight gave up practice, and 45 removed from the county during the year. There have been many changes of address within the county, and instances of removal of midwives from one district to another.

An uncertificated midwife, on changing her address, rarely leaves a district where she is known.

Inspection.—All practising midwives are subject to inspection to ascertain whether they are observing the rules of the Central Midwives Board as to cleanliness, the possession of the required apparatus and antiseptics, the keeping of case books and registers, and the sending of the required notices to the local supervising authority. Miss V. E. M. Bennett, M.B., B.S., was appointed inspector for the purpose of the Act in 1905. There was found, subsequently, need for an additional inspector, and in October, 1906, Miss L. S. Greig, M.B., L.M., D.P.H., was appointed. In November, Miss Bennett resigned her appointment, and the vacancy thus caused was not filled until after the end of the year, when Miss Ida Shields, M.B., B.S., was appointed. In addition to the routine inspection, the inspector has given assistance to midwives by instruction and advice on any difficulties arising in their practice. During the year, 1,092 inspections were made; in 626 cases satisfactory reports were made; in 210 cases the reports were unsatisfactory, or some special question was raised; in 177 cases the midwife was away from home at the time of the inspector's visit, and 79 visits were paid to midwives who had removed or ceased to practise. Under the new rules of the Central Midwives Board, it is the duty of a midwife to report to the local supervising authority any change in her address, and by this means a number of fruitless visits will be saved. In most of the cases where unsatisfactory conditions were found, the inspector drew the attention of the midwife to the matter, and on a subsequent inspection was able to make a satisfactory report. In cases of persistent neglect to observe the rules, the matter was reported to the Midwives Act Committee and a cautionary letter was sent.

Some 59 letters of caution were sent by the Council, as follows:—

Failing to call in medical aid when required by rules to do so	11
Appliances defective or absent	14
Register improperly kept	5
Going to a confinement without disinfection subsequent to attending a case of puerperal fever	1
Failing to send in notices	5
Want of cleanliness	6
Persistent neglect to observe rules	2
Calling in an unqualified man to attend a patient	1
Delay in sending notice of calling in medical aid	14

One woman was suspended from practice for not possessing the required antiseptics and apparatus, and the suspension was removed when these had been obtained. Four women were summoned to attend before the Committee and were cautioned, and seven cases were reported to the Central Midwives Board as *prima facie*

cases of negligence, malpractice or misconduct, as follows:—

Nature of Charge.	Action taken by Central Midwives Board.
Refusing to send required notices	Midwife cautioned.
Do. do.	" "
Placing out an infant to nurse before ten days old	" "
Malpractice and calling in unqualified person as a medical practitioner	Name removed from Roll.
Illegal Operation	No action. Patient refused to give evidence.
Falsifying register of cases	Midwife cautioned.
Want of cleanliness	Name removed from Roll.

In addition to these cases, the conviction of a midwife on a charge of theft was reported to the Board in accordance with section 8 of the Act, and the midwife's name was removed from the roll. In the first of the cases in the above table, where the name was removed from the roll, the midwife appealed to the High Court of Justice against the decision of the Board, and the decision of the Board was upheld. Ten midwives were reported to be more or less illiterate, but such midwives either keep notes of their cases themselves, or make use of relations or friends to keep their register of cases. In three instances, breaches of the rules were said to be due to the midwife not being able to read English, and in this connection it may be stated that some 25 Yiddish midwives practise in East London amongst the Yiddish population, and two Italians practise in the Hatton Garden district.

Uncertified Women.—In addition to the 39 uncertified women practising as midwives, and referred to in my report for 1905, 36 others were brought to notice during the year. In the majority of these cases there appeared to be no infringement of the provisions of section 1 (1) of the Act. In one instance a woman who used the title of midwife was cautioned by letter, and in another case legal proceedings were instituted, and a fine of 1s. and 2s. costs was imposed. One uncertified woman, an Italian, practising in the Italian quarter, had two fatal cases of puerperal fever in her practice, and there was good reason to believe that she carried infection from one case to the other. She was reported to be wanting in cleanliness. Another uncertified woman was concerned in a case in which it was alleged that an illegal operation had been performed. The patient died, and as a result of the coroner's inquest, this woman was brought before the magistrate on a charge of murder. The magistrate did not consider the evidence sufficient, and dismissed the case. A considerable practice is carried on by these unregistered women, and complaints are made from time to time by certified midwives as to their practice.

Medical Aid Notices.—The rules of the Central Midwives Board prescribe that under certain circumstances, which are set out in detail, a midwife

must decline to attend alone and must advise that a medical practitioner be called in. The rules also provide that whenever a medical man is called in the midwife must send to the local supervising authority within 24 hours a notice stating the reason why medical help is required. The number of such notices received during the year was 2,320, or more than twice the number received in 1905. Three midwives called in medical aid 94, 79 and 71 times respectively.

Each of 2 midwives sent 50-70 medical aid notices.			
do. 2	"	40-50	"
do. 5	"	30-40	"
do. 13	"	20-30	"
do. 34	"	10-20	"
do. 236	"	less than 10	"

It will be seen from this statement that of the 490 midwives who gave notice of intention to practice during the year, some 200 did not give notice of calling in medical aid; these were all women who do not practise regularly. It would appear from the notices received that on the average a midwife calls in medical aid to the mother or child in nearly 8 per cent. of the cases she undertakes. The five midwives who sent for medical help more than 50 times are midwives with large practices.

The great increase in the figures over those for 1905 is, no doubt, due to a fuller knowledge on the part of midwives of the rules requiring them to send in their notices.

Still-births.—During the year, 574 still-births were notified, 195 midwives reporting still-births in their practice.

2 midwives each had 16 still-births	32
1 midwife had 12	12
1 " " 10	10
3 midwives each had 9	27
3 " " 8	24
3 " " 7	21
13 " " 6	78
15 " " 5	75
11 " " 4	44
30 " " 3	90
48 " " 2	96
65 " " 1	65
—	574
195	

If this number represents the total number of still-births attended by midwives, it would mean that some 2 per cent. of the children delivered by midwives are still-born. As a matter of fact, with two exceptions, the midwives who had seven or more cases of still-birth in their practice had an incidence of still-births ranging from 2.3 to 4.4 per cent. of total births in their practice. There is reason to believe that all the cases are not notified, and, by comparing the number of cases attended and by those midwives who send in weekly lists of births, with the still-births notified by the same midwives, over 3 per cent. of the cases would appear to be still-born. Out of 2,700 children delivered by midwives of the Royal Maternity Charity, 80 were still-born, or nearly 3 per cent.

Midwives notifying still-births were asked to

supply information as to (a) the period of the gestation of the child, (b) whether it was macerated or not, (c) the presentation. Question (c) was added to the form during the year, so that particulars on this point are not obtained for the whole year. The sex of the child was given in 487 cases—264 were male children and 223 female. On question (a) information was received in 502 cases, as follows:—

Full term	212
Eight months	80
Seven months	84
Six months	55
Under six months	19
Premature (No. of months not stated)	52
	502

To question (b) 465 replies were received. 283 were said to be more or less macerated. 182 " " not macerated.

In 242 cases (c) was answered.	
Ordinary vertex presentations	142
" breech and footling	60
Complicated and other presentations	24
No statement, as child was born before midwife's arrival	15
	242

Of the 212 full-term children, 112 were not macerated. The presentation in the not macerated full-term cases was not stated in 37 cases, but of the others 39 were vertex presentations and 36 breech or other presentations. In 12 cases the midwife attributed the death of the child to antepartum hæmorrhage of the mother. Two were stated to be born with a caul completely over the head, two were hydrocephalic, and three imperfectly developed. In one case of triplets, all were still-born. Of 30 cases of twins, one child was alive in 18 instances, and both children were still-born in 12 instances.

The form of questions has now been included by the Central Midwives Board in the new series of rules, and fuller information on these points is likely to be obtained.

Inquests.—Arrangements have been made with the coroners in London to notify any inquest that is to be held where a midwife has been in attendance on the deceased, and by the courtesy of the various coroners the Council's inspectors are permitted to be present at the inquest, and are referred to in many instances where question is raised as to compliance with the rules of the Central Midwives Board. In this manner many cases of uncertified women practising midwifery have been brought to notice, and additional information has been obtained as to the methods adopted by midwives in the course of their practice.

During the year, 84 inquests were attended by the inspectors; in 7 of these an uncertified woman was concerned. The midwife or woman in charge was censured in 11 cases, and in 7 cases want of skill on the part of the attendant was alleged.

Full reports on all these cases were made, and the censure of the coroner for not calling in

medical aid was followed by a letter of caution from the Council. One case has already been referred to where an uncertified woman was committed for trial on a charge of murder.

Puerperal Fever.—All cases of puerperal fever, where there was reason to believe that a midwife was in attendance on the patient, were investigated, and full details of the illness obtained. For this purpose, early intimation of all notified cases of puerperal fever is received by telephone from the Metropolitan Asylums Board, and weekly lists of deaths from puerperal septic diseases are obtained from the Registrar-General. The term puerperal septic disease is held by the Registrar-General to include puerperal septicæmia, sapræmia, pyæmia, peritonitis and metritis, occurring in connection with parturition. This definition of puerperal fever is in accord with that of the Royal College of Physicians, but a more limited interpretation of the term appears to have been adopted for the purposes of notification. During 1906, 298 cases of puerperal fever were notified, and 187 deaths were registered in London. Of these deaths, 68 referred to cases not notified as puerperal fever, and it would appear therefore to be probable that many cases of puerperal fever in its wider sense, which do not prove fatal, are never officially notified.

The cases classed as puerperal fever in the following table comprise all notified cases, together with the fatal unnotified cases mentioned in the Registrar-General's weekly return:—

These cases were distributed as follows:—

	Cases.	Deaths.
Delivered by certified midwives ...	90	38
Delivered by a medical practitioner with a midwife acting as nurse ...	11	4
Not attended by a midwife ...	255	135
Deaths in London of cases from outside...	10	10
	366	187

Of the 90 cases attended by certified midwives, each of 15 midwives had more than one case during the year, viz.:—

Two midwives (A and B) had four cases each. (A) had two in January, one in April, one in July. These cases followed a case in December, 1905. As the result of inquiry, there seemed to be no ground for attributing the septic infection to the midwife, and it was noted that three of the patients resided in mews. (B) had two cases in February, one in May, one in November. In the second of the cases in February, the confinement took place before notification of the first case as septic.

Three midwives (D, E, and F) had three cases each during the year.—(D) had two cases in January, one in November. In the second of the cases in January, confinement took place before notification of the first case as septic. (E) had one case in February, two in August (one of which was said to be a case of eclampsia). (F) had one in May, a second in June, and a third in October. There was an interval of five weeks between the disinfection of the midwife after attending the first and the confinement of the second case.

Ten midwives had two cases each during the year. The interval between the first and second cases was less than eight weeks in only two instances, and in these the midwife had been disinfected prior to delivering the second patient. There seems to be some doubt in both these instances whether the second case was actually one of puerperal fever.

Of 124 instances where medical aid was called in on account of a rise of temperature, 38 were subsequently notified as puerperal fever. In many cases medical aid had been called in for some other reason, and the following table shows that in 39 instances out of the 90 cases of puerperal fever which occurred in the practice of midwives, the history of the puerperium showed the following abnormalities:—

Condition.	Non-fatal.	Fatal.	Total.
Perineal rupture ...	6	4	10
Retained or adherent placenta ...	5	4	9
Ante-partum hæmorrhage or previous illness of patient.	8	3	11
Difficult labour, forceps used ...	4	5	9

The following table shows, with regard to the 90 cases of puerperal fever occurring in the practice of midwives, the day on which (a) rise of temperature occurred, (b) a medical practitioner was called in, (c) the case was notified:—

	1st day (day of confinement.)	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	After 10th day.
Rise of temperature—											
Recovery 47	2	3	9	10	5	4	2	5	1	2	4
Fatal ... 32	2	2	4	7	3	2	1	3	—	2	6
Medical aid called—											
Recovery 52	8	3	4	8	7	5	2	4	2	3	6
Fatal ... 38	7	3	5	9	2	1	1	2	—	2	6
Case notified—											
Recovery 52	—	—	3	5	3	9	7	9	6	2	8
Fatal ... 31	—	—	1	4	2	3	2	3	2	1	13

Of the 38 fatal cases, 10 died during first week of confinement, 13 during second week, 6 during third week, 4 during fourth week, 3 during second month, 2 during third month or later.

Lists of Births.—Midwives practising within the county were asked to send in weekly lists of the cases attended by them, forms and stamped envelopes being supplied for this purpose. The information thus supplied has been distributed to the several medical officers of health in London, with one exception where the information was not desired. The lists are received each week on Monday and Tuesday morning, and the information is sent to the medical officers on the Friday, so that the mothers may be visited about 11 or 12 days after the birth of the child, i.e., at the time when the midwife ceases to be responsible for the case. Some 212 midwives supplied lists more or less regularly, and among these were most of the

midwives with large practices. Lists were also received from 14 institutions employing midwives. By the courtesy of the authorities of six lying-in hospitals, lists of the addresses of mothers discharged from their hospitals and going to houses in London were also supplied.

The following figures afford some information of the extent of the practice of midwives:—

Each of 22	midwives recorded attendance on more than 300 cases in the year.
" 10	from 250-300 "
" 12	" 200-250 "
" 22	" 150-200 "
" 32	" 100-150 "
" 54	" 50-100 "
" 27	" 20-50 "
" 33	" less than 20 "

212

The midwives of the fourteen institutions mentioned above recorded 5,380 cases attended in the patients' own homes.

The total number of births recorded was 30,749, or about one-quarter of the births in London—of these infants, 1,074 were either still-born or died within a week of birth.

Charges by Midwives.—The fees charged by midwives vary in different localities from 5s. upwards but as a general average a fee of 7s. 6d. (or 10s. if patient be primipara) is expected, while some of the charities employing midwives pay them 5s. a case. It is apparent from the figures given that only a small proportion of midwives can depend solely upon their practice for their livelihood. Some of those midwives having an extensive practice are approved by the Central Midwives Board to give practical instruction to pupils, and in this way supplement their income.

Lying-in hospitals, etc.—The lying-in hospitals in London take in some 5,000 women annually and provide for attendance on some 10,000 patients in their own homes. The poor-law infirmaries, it is estimated, receive 2,000 cases a year. Many charitable institutions also arrange for confinements to be attended either free or at a nominal fee.

Scholarships.—A scheme was arranged in 1905 for granting scholarships of the value of £25 to the pupil midwives. A condition is imposed to the effect that when qualified the scholar must practice for two years in London. Five scholarships were granted during the year.

Class of Midwives.—The Education Committee has arranged classes for instruction in midwifery for the benefit of midwives whose training was deficient, or who were trained many years ago, and many uncertificated midwives have availed themselves of this instruction.

Lying-in Homes.—The question of the licensing of lying-in homes was under consideration during the year, and inquiry was made by Dr. Wanklyn into the accommodation and methods of a number of these homes. An Act passed in 1773 required all lying-in hospitals to be licensed. It was found that four such hospitals had been licensed, but that for over 80 years no application for a license had been made.

THE METHODS AND AIMS OF THE MEDICAL INSPECTION OF SCHOOL CHILDREN.

By H. MEREDITH RICHARDS, M.D.*

FORTUNATELY it is no longer necessary to discuss the relation of school inspection and public health. Nor do I propose to deal with the precise form of local organization, which obviously must vary with local needs, and with the extent and aptitudes of the existing public health staff. Indeed, provided the ultimate unification of the public medical services is clearly borne in mind, local variations in details are desirable, inasmuch, as they will provide the raw material from which experience will ultimately select the special form of organization which will ultimately survive. Given the necessary organization, it remains to consider how the inspection can most readily be made, and what use should be made of the facts ascertained by the inspector.

The Register.—This must be on the card system, suitable portable cabinets being provided for each department. A brief additional note should be made of each child requiring treatment, and this record can readily be filed at the central office for administrative purposes. It has been objected that the filing of the inspection cards at the schools would complicate the preparation of the annual report. This is easily obviated by arranging for the cards to be sent to the central office immediately after the last inspection in the Michaelmas term. In this way the labour of tabulating results would be spread over the last quarter of the year, and the cards need not be absent from the school for more than a few days in each year.

The Role of the Teacher.—While the co-operation of the teacher is essential, it would seem very undesirable to demand more assistance from these officers than they are able and willing to give. The head teacher must be present at the examination, so that necessary information may be given and received. Ultimately, teachers will be most helpful to the inspector, but full advantage cannot be taken of their aid until they have got accustomed to our methods and appreciate our aims. Personally I have told our head teachers that

*A revise of remarks made in opening a discussion at the Home Counties Branch.

I shall be grateful for all the help they can give, but do not demand more than the entry of the names and addresses, and dates of birth on the inspection cards. I shall, however, have a staff of five health visitors, each of whom will spend one day each week in the schools, so that they may render assistance in the inspections, and become familiar with the children in their districts who will need to be supervised. Where health visitors or school nurses are not available, plans must be modified accordingly.

The Schedule.—Everyone who has tried to frame a schedule for his own use must agree that it is quite impossible to satisfy either himself or anyone else, and few would suggest that that issued by the Board of Education is verbally inspired. The Board had to avoid both the Scylla of unnecessary minutiae and the Charybdis of inaccurate generalisation. I have heard objections made to the schedule from both points of view, and this is suggestive that a safe middle course has actually been steered.

It would seem that those who complain of too much detail, forget that in organizing medical inspection, both local authorities and their officers are breaking new ground, and that it is essential to have some basis of agreement as to the general lines along which the work should in the first instance proceed. Careful study of the notes shews that considerable elasticity is really provided for, and that the slavish completion of each item on the schedule is neither required nor desired. Personally, I have always regarded a schedule as a mere mechanical device for saving time by the establishment of a fixed routine and by affording a rapid means of reference to any particular note made at a previous examination. True that a brief note on a blank card is often sufficient for immediate administration purposes; yet how often it happens that some further question subsequently arises when one has forgotten whether, say, heart or lungs were examined. A glance at the schedule would at once settle that point.

Those who looked for more detail, and especially those who object to the suggestion that each individual child need not be stripped, may be reminded that Section 13 of the Education Act, 1907, provides for this "inspection," and not for the complete examination of each child. Any who are thirsting for more worlds to conquer, may take courage from the fact

that a comparatively superficial inspection of school children will discover a far greater number of children requiring "amelioration" than any existing organization is capable of dealing with. Happily, too, the majority of school children are normal little people who would be none the better for being percussed and auscultated, though they might become better citizens if some of the larger problems of school hygiene were satisfactorily solved, problems which may be easily lost sight of if a true sense of proportion is not maintained.

The Order of the Schedule.—In Croydon we propose to depart somewhat from the order given in the official circular of the Board, and to take Nos. 1, 3, 5, 6, 8, 4 and 12 first, as it is intended that this part of the inspection should be made by a trained nurse* under the immediate supervision of the medical inspector. Similarly, it seems a little more convenient to group together hearing, speech, standard, regularity of attendance and mental condition, as these are all matters concerning which the teacher has to be consulted. This, however, is a mere question of local convenience, and would not necessarily apply in other districts.

Time required for Inspection.—Provided one has the assistance above referred to, an experienced medical officer can inspect about twenty-five children in a school session, assuming that those requiring more detailed study are referred to a centre for more complete examination. In this I am glad to be confirmed by Dr. Crowley, who finds he can inspect ten children per hour, even if he takes the heights and weights himself. It should be borne in mind that a two hours' session is not only mentally fatiguing, but, after a time, produces more or less boredom, so that every opportunity must be taken for varying the monotony of the work. It is for this reason that the inspection should be as rapid as is compatible with practical results, as one must conserve some of the energy of the inspector for other and more stimulating problems of school hygiene.

The place for Inspection must be the school, and in new schools a quiet, well lighted room, with a length of 20 feet for vision testing should be provided. In the older schools inspection is carried on with great difficulty, and a satisfactory physical examination is

* The District Health Visitor.

often well-nigh impossible. In such cases some of the children must be referred to a centre, or examined at the end of a school session, the other children being dismissed a little before the usual time. A competent teacher will usually suggest ways of diminishing difficulties of this sort. In any case, one or more properly equipped centres must be provided in the larger districts for detailed examinations—e.g. for ophthalmoscopy, retinoscopy, laryngoscopy, examination of the ear, etc., etc.

Apparatus.—Each inspector will, in addition to a stethoscope and thermometer, need a lens and forceps for examining ringworm, hairs, and a sufficiency of tongue depressors. For the latter nothing is more convenient than a bundle of wooden slips such as are used for labelling plants.

Weighing Machines.—Probably the steel-yard type, with a pillar about five feet high, will be found most satisfactory. This can readily be supplied with a double set of weights (metric and avoirdupois) graduated to 100 grammes, or $\frac{1}{4}$ lb. Should both weights be supplied, they should be of different shape so as to avoid confusion. If pounds are used, they should be on the decimal system, so as to eliminate confusion of stones and quarters. Each machine should be guaranteed to pass the local inspector of weights and measures, who should test it at fixed intervals. Though spring balances suggest favourable consideration, I have not found satisfactory evidence of their permanent reliability.

With respect to price, it will probably be found possible to get a sufficiently delicate steelyard specially designed for school purposes and weighing up to 200 lbs. for about £2 10s., but I cannot at present speak with certainty, as some of those ordered on approval have not been delivered.

It cannot be too widely known that many of the cheap machines now on the market are quite unreliable and need constant adjusting. A few days ago one was submitted which gave an error of 2 lbs., while numerous other cheap machines were rejected by the local inspector.

Height Standard.—Several patterns are available. The one which consists of a slotted boxwood scale marked in centimetres* and

* The balance of convenience is probably in favour of the metric system.

inches is as convenient as any, and has the merit of cheapness, thus enabling authorities to fix one in each department.

The Details of the Schedule.—Many points could be discussed with advantage, but time forbids. Convenience suggests the use of symbols as a means of saving time at the inspection and when tabulating the results. Under "Previous Illnesses" one should enter "B. A." for "before admission," and add the year of occurrence if the disease contracted after school age.

Other Illnesses.—Rheumatism and fits are the outstanding diseases that should be noted. Rupture might also be inquired for.

Standard and Regularity.—Standards vary in different schools. What one wants to know is whether the child is working with children of the same age, and if not, whether this is accounted for by irregularity of attendance. Every child much—say two years—below his equals in age should be specially examined for physical (especially sensory) or mental defect.

Under most of the headings the standard adopted must be practical and administrative, and therefore provisional. For instance, what has to be decided is whether, say the condition of clothing, throat, teeth, is satisfactory, passable, or definitely requires remedial measures and special advice.

It is in respect to Section V. and Note 19 of the schedule that difference of opinion is most likely to arise. Under what circumstances is one justified in examining the chest of a child? The wishes of the parent, if present, must be respected, though I have never known a parent make any objection if treated tactfully. In the absence of the parent I would not remove the clothing unless a preliminary examination suggested the presence of disease. When communicable disease is suspected, I think one would be justified in risking subsequent complaint, and in Croydon we are fortified by special statutory powers in this behalf—legal power, it must be added, which we have never had to enforce. The Education (Defective and Epileptic Children) Act, 1899, also requires parents to submit for examination children alleged to be mentally or physically defective, and use might be made of this section if the preliminary inspection suggested that the child might reasonably be included in this category. Compulsion, as a general rule, is obviously to be avoided, and it is to be hoped

that few inspectors will be so weak, or so tactless, as to need support from the law as far as our work in the schools is concerned.

In practice we shall find that most of these suggested difficulties will vanish if we are content to hasten slowly, to respect prejudices, "to suffer fools gladly," and, above all, spare no effort to gain the confidence of the little people, whose physical well-being is, to some extent, at any rate, in our hands.

It is in the examination of the throat that trouble is most likely to arise when dealing with nervous children. A *prima facie* case for operative interference can always be made out without putting the child to the extremely unpleasant ordeal of a digital examination of the pharynx. If the obstruction is found to be more or less permanent, and not the result of a passing "cold," then the child should be referred elsewhere for treatment.

If inspection has to be undertaken while other children are present, it is always worth while asking the teachers to pick out the more stolid members of the class, as failure to gain the confidence of the first batch makes the subsequent examination almost impracticable. Teachers are also most helpful in indicating children whose parents are known to be "difficult."

Eye Work.—While provisional testing will be done in school, detailed examination and estimation of errors of refraction, and prescription of glasses, must be done at a centre. In country schools the exact procedure must depend on local circumstances, and on the extent of the trouble that the preliminary inspection reveals.

Subsequent Procedure.—When the parents are present at the inspection, appropriate advice can often be given forthwith. This specially applies to unsuitable clothing, uncleanly conditions, oral sepsis and defective nutrition. Note should be made of the advice so tendered, and the children supervised by the school nurse in order that the conditions may, as far as possible, be rectified.

When several parents are present, the inspector may frequently take the opportunity of giving a few plain directions concerning open windows, clothing, hours of sleep, choice of food. We must not miss the chance of improving the healthy in our efforts to cope with the sick.

Children requiring medical treatment must be referred to their medical attendant, while

those requiring operative interference must seek it at a suitable hospital. Whenever possible use must be made of local agencies, such as guilds of help, more especially when material assistance, convalescent letters, or surgical instruments are likely to be required. Even with our present limitations, considerable improvement can be effected if full advantage is taken of existing machinery.

Thus, on a recent morning, advice had to be given for the following conditions:—

- (a) A cured psoas abscess, followed by lameness and debility. Advised to seek admittance to a physically defective school, or, in the alternative, make special arrangements for conveyance to and from an ordinary school.
- (b) Infrequent epilepsy. Found treatment had been neglected. Advised to resume medical treatment and report later.
- (c) Chorea with mitral disease, parents poor. Referred to guild of help for investigation. Subsequently signed a certificate for hospital treatment.
- (d) Suspected "consumption." Apparently only chronic naso-pharyngeal catarrh. Advice as to hygienic treatment.
- (e) Congenital nystagmus with very defective vision. To be admitted to a special class, where manual training predominates.
- (f) Numerous children with ringworm were offered treatment at the expense of the borough.

I do not wish to labour this point on this occasion, but two conclusions are obvious from past experience of school work.

(1). The connection between the education authority and the local hospitals must be more intimate, and it is doubtless reasonable that the cash nexus should in the future form one of the connecting links. At present, hospitals and schools work on divergent lines, with the necessary result that the usefulness of both is impaired. Thus parents evade school attendance by taking their children to out-patients' departments for trivial ailments, and the attendance officer has to be content with the statement that the child is "under hospital treatment." Obviously the medical officer of the schools should be able to ascertain why the child is attending hospital, and whether it is fit to attend school. Again, much of the good work done in hospitals is

wasted, because subsequent hygienic supervision is impracticable. Thus many children operated on for adenoids rapidly relapse because breathing exercises are not persevered with. At the moment, we are endeavouring to get a weekly list of adenoid operations from our local hospital, in order that attention should be paid to this point.

(2) There is also no doubt that existing machinery is incapable of dealing with all the children requiring treatment, but I imagine that the proper line of action is, in the first instance, to use existing agencies to the full. When that has been done the further problems must be faced in detail as they arise, though no considerable developments are practicable until general medical inspection is in being, and local authorities realise the conditions which it will have brought to light.

In the course of these remarks I have been accused of being too optimistic, and of building "castles in the air." To the latter charge I can only reply with Emerson, that that is where they should be, and that it is your business and mine to put in the foundations.

AN EPIDEMIC OF CONTAGIOUS IMPETIGO.

By A. E. PORTER, M.D., D.P.H.,

Medical Officer of Health, Reigate Rural District.

ALTHOUGH cases of impetigo not infrequently run through one or more families, and through teams of footballers—especially those who play the handling game—it is, judging by the absence of recorded instances, apparently rare for the disease to take a true epidemic course similar in nature to varicella or other zymotic complaints, and a short account of an outbreak affecting two adjoining and sparsely populated parishes in the Reigate Rural District may therefore be of interest.

Under a system of notification by teachers of infectious and contagious diseases, initiated by the Surrey County Council, I received, on January 9th, a list of nineteen boys belonging to fourteen families, who had been excluded from the boys' school in C. parish on account of impetigo contagiosa, the diagnosis being made by a local medical practitioner who happens to be one of the school managers. The parish has a population of about 1,800

and an area of 7,000 acres. The majority of the children attend the schools in the village, the boys' school being entirely separate from those of the girls and infants, and upwards of a quarter of a mile away. It consists of a single room, and the average attendance is ninety-three. All the nineteen boys were at school on January 6th, when the term began. The list was followed by others on the 10th and 11th, affecting seven boys in the same number of fresh families, so that between one-third and one-quarter of all the scholars had been attacked.

Thinking that the complaint might possibly be varicella, scabies, or foot-and-mouth disease, I called at the school and at various houses attacked, and satisfied myself that the disease was ordinary impetigo. The inquiries shewed that in every family known to be affected, the first case was that of a boy at school; no primary cases had apparently occurred in the girls' or infants' schools, though the sisters, and frequently the fathers, mothers, and elder children, had in many instances been subsequently attacked. The contagium appears to have been of a very active character, and to have infected slight wounds, such as scratches from brambles, burns, and chapped hands, whenever the opportunity offered itself. I did not see any severe cases; often only one or two fingers were attacked; occasionally the hands, wrists, and faces, and, very rarely, portions of the body covered by clothing. On the face the eruption was of the ordinary type so often seen after facial herpes; on the fingers superficial whitlows were frequently met with. In addition to crops of pustules, the appearance on the hands and other parts of the body was that of a number of raised inflammatory patches, about the size of a threepenny piece, and partially covered by scabs. None of the patients that I saw seemed to be affected in health, and none could be described as poorly nourished.

The primary cases were scattered all over the parish, and there was not the slightest doubt that the infection was almost, if not entirely, contracted at school. On further inquiry I ascertained that a few cases had been noticed at the end of the previous term, the schoolmaster being one of the victims. It had been anticipated that the holidays would have the effect of stopping the disease, and consequently no steps had been taken in the matter.

The total number of cases in C. parish is somewhat a matter of speculation, but it was certainly not less than fifty, and was probably considerably greater.

Further investigations shewed that the first case in C. parish to be noticed was that of a boy living in the adjoining parish of L., but attending the school in C., and on visiting the mixed school at L. (average attendance 108), I found that there had been a small outbreak here, commencing in November or December, and extending into the new year. I could only obtain a record of 12 cases in eight families, but no particular notice had been taken of the event. I recollected, however, being asked to see a child from this school, on November 22nd, who was thought to be suffering from varicella, but who actually had impetigo. It is fairly clear, therefore, that the disease commenced in L. parish, and thence spread to C., apparently increasing in activity in its passage.

As regards the school at L., since the outbreak seemed to be virtually over, no steps were taken, beyond excluding children with unhealed sores. At the C. boys' school, however, I thought it desirable that the room, lobbies, desks, etc., should be thoroughly cleaned by a wet process embracing the use of a suitable disinfectant, and the walls sprayed. No slates are used, and I recommended the writing-books to be burnt, and pencils, pen-holders, etc., to be soaked in a fluid disinfectant, which the District Council provided for the purpose. The reading-books were more difficult to deal with, but were first submitted to dry heat, and then exposed to fumes of sulphur-dioxide. The schools were closed for a few days so that the processes might be carried out effectively.

The school manager referred to offered to send a supply of ointment to the school for distribution, and the master was also given some fluid disinfectant to be used if necessary among the boys attacked. Since the school reopened, only one fresh case has been heard of.

Epidemics of this kind, if mentioned at all in text-books, are dismissed in general terms, and even then it would be gathered that they are to be met with chiefly in schools deriving their children from the poorer quarters of a town, where the progress of an epidemic is naturally more difficult to trace than is the case in a sparsely populated rural district.

REVIEWS.

POOR LAW ORDERS. Arranged and annotated by Herbert Jenner-Fust, M.A., late General Inspector to the Local Government Board—London: P. S. King & Son, 1907.

In this book are presented the principal Orders of the Poor Law Commission, the Poor Law Board and the Local Government Board, under which Poor Law authorities and their officers have to work. The various orders are well arranged, the explanatory notes really do explain—which is not always to be said of books of this class—and an unusually full and copious index is given. With these advantages the information contained is readily available, and those engaged in the administration of the Poor Law will find the book a valuable instrument to work with. Much of the information, however, is of considerable general interest, and certain sections, especially those relating to smallpox and vaccination, will be found useful by medical officers of health.

SCHOOL HYGIENE. By Robert A. Lyster, M.B., D.P.H., etc., Medical Officer of Health, and Medical Officer to the Education Committee, Handsworth. Published by the University Tutorial Press, 1908.

Dr. Lyster may be congratulated upon having produced a sound and practical text-book on a highly important subject. Within the space of some 350 pages he has succeeded in giving an adequate account of what a teacher ought to know about school hygiene, and the style, though necessarily condensed, never ceases to be clear and readable. Dr. Lyster treats his subject in three sections: (1) The School Building, (2) the Scholar, and (3) Medical supervision and school medicine and surgery, and each is discussed in a practical way, and in plain non-technical language. The book is mainly intended for teachers, and, indeed, consists largely of the material of various courses of lectures the author has delivered to teachers in the West Riding and in the Midlands. The book may be confidently recommended to teachers and it may well find a place in the library of the medical officer of health.

HOUSING UP-TO-DATE. By Alderman W. Thompson. Published by the National Housing Reform Council, London, 1907.

In publishing this supplement to his "Housing Handbook," which appeared in 1903, Alderman Thompson has conferred a distinct benefit on all who are interested in housing reform. The present volume describes the progress of the housing movement since the appearance of the "Handbook," and it contains a remarkable amount of detailed information in a small compass. It is copiously illustrated by plans, diagrams, etc., and contains a chapter on "Town Development," which is of special interest at the present time. The book can be strongly recommended to medical officers of health, and to all who are concerned in the various aspects of the housing question.

THE MEDICAL INSPECTION OF SCHOOL CHILDREN.

THE following highly important circular, with accompanying schedule, has recently been issued by the Board of Education:—

23rd January, 1908.

EDUCATION (ADMINISTRATIVE PROVISIONS) ACT, 1907, SECTION 13.

1. The accompanying schedule has been drawn up in response to requests which the Board of Education have received for further and more definite guidance as regards the details of the work of medical inspection than was given in the Memorandum (Circular 576), which was issued by the Board on 22nd November, 1907. The Board have, indeed, been pressed by many Local Education Authorities to issue a complete set of forms for use in carrying out the work directly or incidentally involved in the performance of these new duties. Any forms which experience of the working of the Act may shew to be necessary or desirable will be issued in due course, but for the present the Board think it expedient to leave considerable latitude, subject to the considerations hereinafter set out, in regard to the particular forms or schedules to be used in different cases or circumstances.

2. The chief difficulties to be considered are administrative rather than educational or scientific. There is comparatively little dispute as to the end in view, or as to the means which, from the technical standpoint of medical science and practice, should be adopted for its complete attainment.

But the existing resources of Local Education Authorities are (for practical purposes, at all events) not unlimited, the feelings and prejudices of parents have to be considered, and a new element has to be introduced into school life and organization with the least possible disturbance and inconvenience. Moreover, in this case two departments of local public administration are brought for the first time into organic connection—those of public health and of public education.

3. The Board are fully aware of these difficulties, and in preparing their Memorandum and Regulations it was necessary for them to consider what system would best reconcile the theoretical and practical considerations, and overcome the divergence between the ultimate end and the end immediately attainable, or between the methods which are scientifically desirable and those which can be applied in existing circumstances at the initiation of the work under the Act.

4. In the accompanying schedule the Board indicate the particulars, attention to which they regard as constituting the *minimum* of efficient medical inspection, and they consider that at least

these particulars should be included in any other schedule which the Local Education Authority may authorise for use in their schools. It deliberately excludes many points of anthropometric or statistical interest which are worthy of attention, and which it is hoped may receive attention in suitable districts. Nor does it profess to lay down the lines of a clinical study or of a scientifically complete medical examination. It is intended to indicate the methods which, in the Board's opinion, should be followed, and the particulars which should be attended to for the purpose of determining the fitness of the individual child for school life, to guide the Authority in adapting education to the peculiarities or abnormalities of the child, and to prepare the way for measures for the amelioration of defects in the child or its environment.

A more elaborate and complete form could readily be devised, but the Board's knowledge of the circumstances in which the work is to be done leads them to believe that greater elaboration would in the majority of cases defeat its own end.

5. If this schedule is properly used, few cases of serious physical weakness or defect will escape detection. Where the ordinary inspection shews the need of further and more searching medical examination, a supplementary blank form should be used in which particular defects or diseases should be fully recorded. It may facilitate inspection if the schedule is printed on cards (8 in. by 5 in. or 10 in. by 6 in.). The notes are included in the attached form for the convenience of the school medical officer, and should not be reprinted on the cards. Of course it is not necessary that negative findings on all the points mentioned in the notes should be recorded.

It will be noticed that a space is reserved in the schedule for "general observations"; this may conveniently be used to record a general summary of the condition of the child, and any information which may be available as to the home environment, or other conditions affecting its health.

It is considered that the inspection of each child should not occupy on the average more than a few minutes and that the child need only, as a rule, have its clothes loosened or be partially undressed. Time may be saved in the actual inspection by the medical officer if the entries in some of the spaces are filled in by the school authorities before his visit. The four columns in the schedule are designed for the four inspections required during school life.

With regard to items 17 to 24 of the schedule, while it is necessary that all indications of diseased or unsound conditions should be thoroughly investigated, needless medical examination of healthy children should, for obvious reasons, be avoided.

6. Where children are found to belong to that class of "defectives" for whose education special provision is or ought to be made under the statutes relating to such children, such cases should be made the subject of a special report to the Local Education Authority.

7. All entries of the results of inspection in each individual case must be regarded as confidential.

MEDICAL INSPECTION OF SCHOOL CHILDREN—*continued*.

NOTES FOR INSPECTING OFFICER.

Reference
number
of Note.

1. Date of birth to be stated exactly, date of month and year.
2. "Other illnesses" should include any other serious disorder which must be taken into account as affecting, directly or indirectly, the health of the child in after-life, *e.g.*, rheumatism, tuberculosis, congenital syphilis, small-pox, enteric fever, meningitis, fits, mumps, etc. The effects of these, if still traceable, should be recorded.
3. State if any cases of, or deaths from, phthisis, etc., in family.
4. Note backwardness.
5. Age to be stated in years and months, thus, $5\frac{4}{12}$.
6. Insufficiency, need of repair, and uncleanness should be recorded (good, average, bad).
7. Without boots, standing erect with feet together, and the weight thrown on heels and not on toes or outside of feet.
8. Without boots, otherwise ordinary indoor clothes.
Height and weight may be recorded in English measures if preferred. In annual report, however, the final averages should be recorded in both English and metric measures.
9. General nutrition as distinct from muscular development or physique as such. State whether good, normal, below normal or bad. Under-nourishment is the point to determine. Appearance of skin and hair, expression, and redness or pallor of mucous membrane are among the indications.
10. Cleanliness may be stated generally as clean, somewhat dirty, dirty. It must be judged for head and body separately. The skin of the body should be examined for cleanliness, vermin, etc.; and the hair for scurf, nits, vermin, or sores. At the same time ringworm and other skin diseases should be looked for.
11. General condition and cleanliness of temporary and permanent teeth, and amount of decay. Exceptional features, such as Hutchinsonian teeth, should be noted. Oral sepsis.
12. The presence or absence of obstruction in the naso-pharynx is the chief point to note. Observation should include mouth-breathing; inflammation, enlargement, or supuration of tonsils; probable or obvious presence of adenoids, polypi, specific or other nasal discharge, catarrh, malformation (palate), &c.
13. Including blepharitis, conjunctivitis, diseases of cornea and lens, muscular defects (squints, nystagmus, twitchings), etc.

Reference
number
of Note.

14. To be tested by Snellen's Test Types at 20 ft. distance (= 6 metres). Result to be recorded in the usual way, *e.g.*, normal V. = $\frac{6}{6}$. Examination of each eye (R. and L.) should, as a rule, be undertaken separately. If the V. be worse than $\frac{6}{9}$, or if there be signs of eye strain or headache, fuller examination should be made subsequently. *Omit vision testing of children under 6 years of age.*
15. Including suppuration, obstruction, etc.
16. If hearing be abnormal or such as interferes with class work, subsequent examination of each ear should be undertaken separately. *Apply tests only in general way in case of children under 6 years of age.*
17. Including defects of articulation, lisping, stammering, etc.
18. Including attention, response, signs of overstrain, etc.
The general intelligence may be recorded under the following heads:—(a) Bright, fair, dull, backward; (b) mentally defective; (c) imbecile. *Omit testing mental capacity of children under 6 years of age.*
19. Under the following headings should be inserted "particulars of diseased conditions actually present or signs of incipient disease. The extent of this part of the inspection will largely depend upon the findings under previous headings.
20. Include heart sounds, position of apex beat, anæmia, etc., in case of anything abnormal or requiring modification of school conditions or exercises.
21. Including physical and clinical signs and symptoms.
22. Including chorea, epilepsy, paralyses and nervous strains and disorders.
23. Glandular, osseous, pulmonary, or other forms.
24. State particular form, especially in younger children.
25. Including defects and deformities of head, trunk, limbs. Spinal curvature, bone disease, deformed chest, shortened limbs, etc.
26. Including any present infectious, parasitical or contagious disease, or any sequelæ existing. At each inspection the occurrence of any such diseases since last inspection should be noted.
27. Any weakness, defect or disease not included above (*e.g.*, ruptures) specially unfitting child for ordinary school life or physical drill, or requiring either exemption from special branches of instruction, or particular supervision.

MEDICAL INSPECTION OF SCHOOL CHILDREN—*continued*.

SCHEDULE OF MEDICAL INSPECTION.

I.—Name _____ Date of birth¹ _____
 Address _____ School _____

II.—Personal history—

(a) Previous illnesses of child (before admission).

Measles.	Whooping Cough.	Chickenpox.	Scarlet Fever.	Diphtheria.	Other Illnesses. ²

(b) Family medical history (if exceptional).³

	I.	II.	III.	IV.		I.	II.	III.	IV.
1. Date of inspection -					13. Ear disease ¹⁵ - -				
2. Standard and regularity of attendance. ⁴					14. Hearing ¹⁶ - - -				
3. Age of child ⁵ - -					15. Speech ¹⁷ - - -				
4. Clothing and footgear ⁶ -					16. Mental condition ¹⁸ -				
[III.—General Conditions.]					[V.—Disease or Deformity.] ¹⁹				
5. Height ⁷ - - -					17. Heart and circulation ²⁰				
6. Weight ⁸ - - -					18. Lungs ²¹ - - -				
7. Nutrition ⁹ - - -					19. Nervous system ²² -				
8. Cleanliness and condition of skin. ¹⁰					20. Tuberculosis ²³ - -				
Head - - -					21. Rickets ²⁴ - - -				
Body - - -					22. Deformities, spinal disease, etc. ²⁵				
[IV.—Special Conditions.]					23. Infectious or contagious disease. ²⁶				
9. Teeth ¹¹ - - -					24. Other disease or defect. ²⁷				
10. Nose and throat ¹² -									
Tonsils - - -									
Adenoids - - -									
Submax. and cervical glands.									
11. External eye disease ¹³ -									
12. Vision ¹⁴ - - -									
R.					Medical officer's initials -				
L.									

General observations.

Directions to parent or teacher.

INFANT MORTALITY STATISTICS.

FROM A SPECIAL REPORT BY D. S. DAVIES, M.D., Medical Officer of Health, Bristol.

I AM entirely in sympathy with any work undertaken for the control of excessive infant mortality, and I hope that the appointment of special health visitors will enable me shortly to undertake, in Bristol, some useful work to this end. But, in estimating the value of work of this kind, we must be careful in our use of statistical methods, lest too much be claimed and disappointment result.

I append a comparative chart and comparative reports for Bristol and Huddersfield, from which it is at once evident that the wholesale improvement in the Huddersfield infant mortality returns, claimed as due to the special measures taken there, is not proved by the

figures adduced to be due either entirely or in any large degree to these measures; for a practically identical improvement has taken place during the same years in Bristol without any special methods to this end having been taken.

An improvement in Huddersfield, probably represented by the slight difference between their figures and those of Bristol, may be due to the special measures adopted there, and it is worth some labour to secure even small results in the matter of infant mortality. There is no advantage, however, in deceiving ourselves as to the extent of the improvement to be expected.

Huddersfield.

During 1907, 2,189 Births occurred in the Borough, and 212 infants less than 12 months old died, giving an Infant Mortality figure of 97.

The records of the department extend back for 31 years, and how very successful the work has been will be perceived from a reference to the accompanying diagram, which shows that the present figure is the lowest on record; for the first time it has fallen below 100. The mean for the 10 preceding years, 1897 to 1906, inclusive, was 135. Thus there has been effected a reduction of 28 per cent. The mean for the three years 1905-6-7 during which the work has been in progress is 117, and for the 10 years preceding this, 1895 to 1904, inclusive, was 142.

	Births registered.	Deaths under one year of age.	Infant mortality figure.	
1907.	2,189	212	97	Reduction 28 per cent.
Preceding 10 years 1897-1906.	22,991	3,104	135	
The 3 years during which special work against infant mortality has been in progress, 1905-6-7.	6,746	792	117	Reduction 18 per cent.
Preceding 10 years 1895-1904.	22,631	3,215	142	

Huddersfield is an industrial centre with not less than 25 per cent. of the female population at child-bearing ages working in textile factories. It is therefore the more surprising to find the Infant Mortality figure reduced to a rate comparable to that of the healthiest counties and rural districts.

Estimated Population 1907 ... 94,814.

Bristol.

During 1907, 8,915 Births occurred in the Borough, and 900 infants less than 12 months old died, giving an Infant Mortality figure of 100.9.

The records of the department extend back for 31 years, and the accompanying diagram shows that the present figure is the lowest on record; for the first time it has fallen to 100. The mean for the 10 preceding years, 1897 to 1906, inclusive, was 135. Thus there has occurred a reduction of 26 per cent. The mean for the three years 1905-6-7 is 117, and for the 10 years preceding this, 1895 to 1904, inclusive, was 138.7.

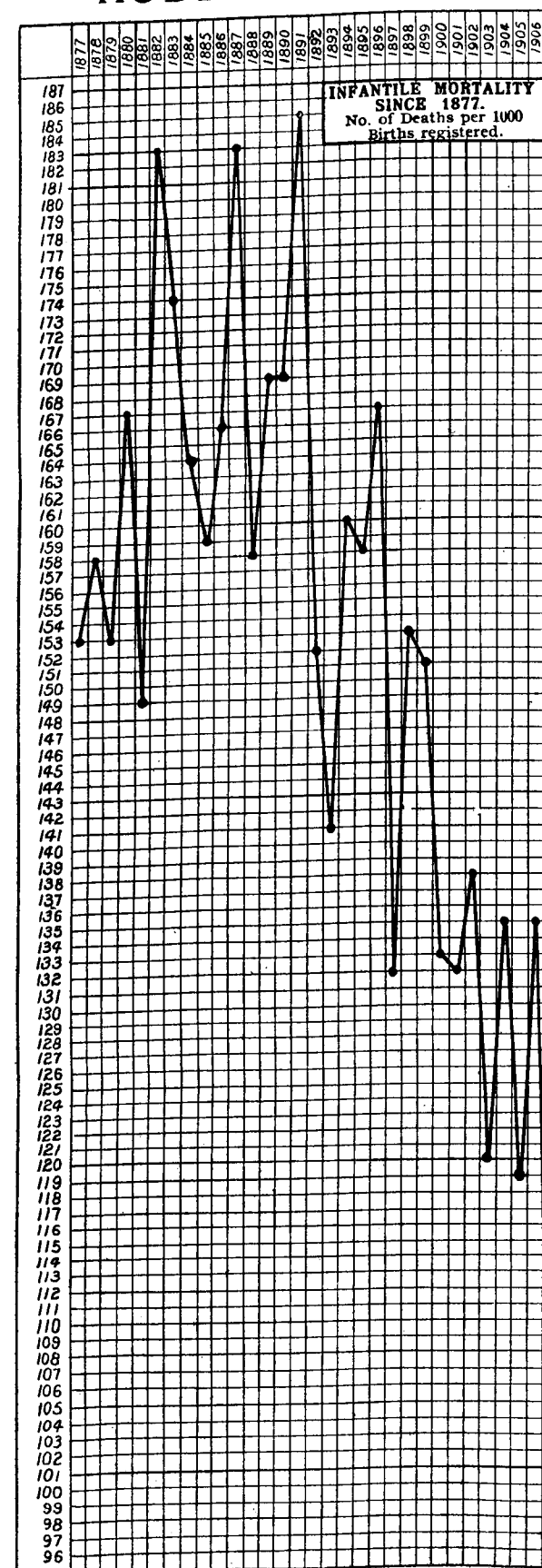
	Births registered.	Deaths under one year of age.	Infant mortality figure.	
1907.	8,915	900	100.9	Reduction 26 per cent.
Preceding 10 years 1897-1906.	89,535	12,151	135	
The 3 years, 1905-6-7.	27,936	3,278	117.3	Reduction 15 per cent.
Preceding 10 years 1895-1904.	83,673	11,616	138.7	

Bristol is an industrial centre, and the following table shows the proportion of married or widowed females at ages from 20 to 45 (child-bearing ages) engaged in occupations (Census 1901, Appendix A, Table 31)

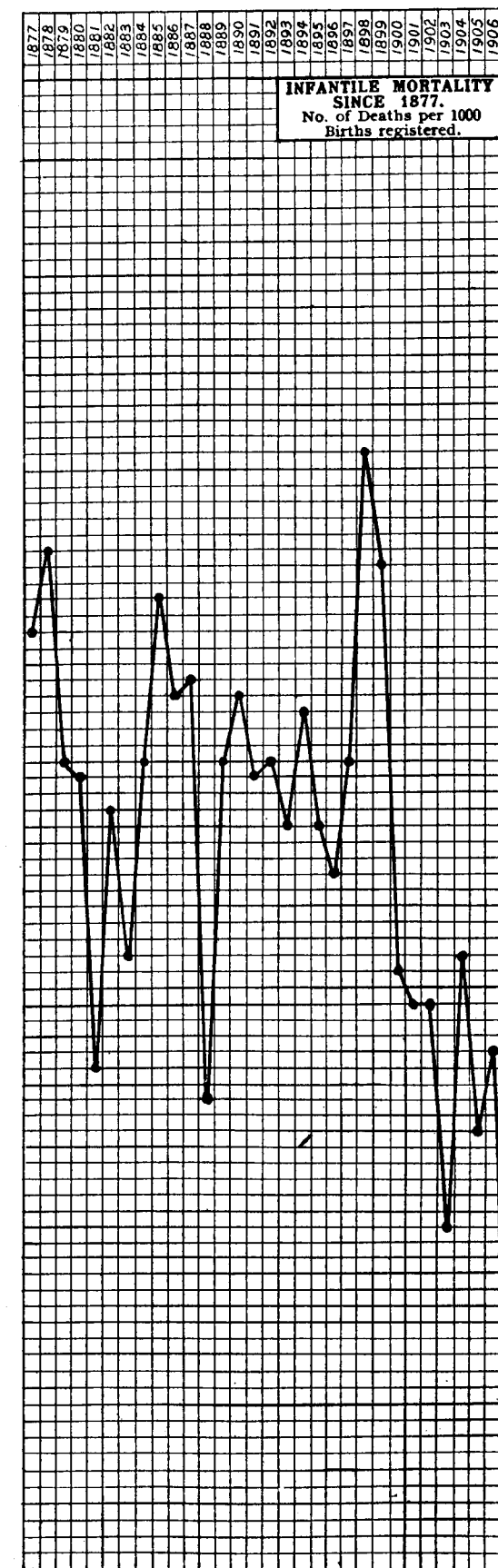
	20-25.	25-35.	35-45.
Bristol	14.8	12.3	16.7
Huddersfield	20.9	12.4	13.6

Estimated Population 1907 ... 367,979.

HUDDERSFIELD.



BRISTOL.



THE CHIEF VITAL STATISTICS FOR THE YEAR 1907.

FROM THE QUARTERLY RETURN OF THE REGISTRAR-GENERAL, JANUARY, 1908.

ACCORDING to the quarterly returns furnished by local registrars, 917,636 births and 524,321 deaths were registered in England and Wales in the year 1907. The natural increase of population, by excess of births over deaths, was therefore 393,315, the average annual increase in the preceding five years having been 409,456.

The birth-rate in England and Wales in 1907 was 26·3 per 1,000 of the population, which is 0·8 per 1,000 below the rate in 1906, and lower than the rate in any other year on record; compared with the average in the ten

experienced in 1907, which checked the rise in the rate of child mortality that usually occurs in the third quarter of the year. Compared with the average in the ten years 1897-1906, the rate of infantile mortality in 1907 shewed a decrease of 27 per 1,000. The death-rate among persons aged between one year and sixty years was 7·5, and that among persons aged sixty years and upwards was 69·4, per 1,000 of the estimated populations at the respective groups of ages.

The total deaths registered included 12,409 from measles, 10,304 from diarrhoea, 10,036 from whooping cough, 5,648 from diphtheria, 3,203 from scarlet fever, 2,344 from "fever" (including the three principal forms—typhus, enteric fever, and pyrexia of uncertain origin), and 9 from smallpox. Thus 43,953 deaths

BIRTH-RATE, DEATH-RATE, AND ANALYSIS OF MORTALITY IN THE YEAR 1907.

	Annual Rate per 1,000 living.										Deaths under one year to 1,000 Births.
	Births.	Deaths.	Principal Epidemic Diseases Cols. 4-10.	Small-pox.	Meas es.	Scarlet Fever.	Diphtheria.	Whoop- ing Cough.	Fever.	Diarrhoea.	
Cols.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
England and Wales	26·3	15·0	1·26	—	0·36	0·09	0·16	0·29	0·07	0·29	118
76 great towns ...	27·0	15·4	1·54	—	0·43	0·12	0·17	0·35	0·07	0·40	127
142 smaller towns	25·7	14·5	1·29	—	0·41	0·08	0·15	0·29	0·07	0·29	122
England and Wales less the 218 towns	25·6	14·7	0·91	—	0·25	0·06	0·15	0·21	0·6	0·18	106

years 1897-1906, the birth rate in 1907 shewed a decrease of 2·1 per 1,000.

The death-rate in 1907 was 15·0 per 1,000, which was 0·4 per 1,000 below the rate in 1906, and lower than the rate in any other year on record; compared with the average rate in the ten years 1897-1906, the death-rate in 1907 shewed a decrease of 1·7 per 1,000.

The 524,321 deaths registered in 1907 included 108,214 of infants under one year of age, 236,656 of persons aged between one year and sixty years, and 179,451 of persons aged sixty years and upwards. The rate of mortality among infants under one year of age to 1,000 registered births was 118, which is 14 per 1,000 below the rate in 1906. The rate in 1907 was lower than the rate in any other year on record; this was mainly due to the showery and exceedingly cool summer

were attributed to these epidemic diseases, corresponding to a rate of 1·26 per 1,000 living, against 1·94, 1·52, and 1·73 respectively in the three preceding years.

To different forms of violence 19,651 deaths were referred, being in the proportion of 0·56 per 1,000 of the population, against 0·57 per 1,000 in each of the preceding three years.

The 524,321 deaths included 36,326 cases, or 6·9 per cent., in which inquests were held; and 7,554 cases, or 1·4 per cent., in which the causes were not certified either by registered medical practitioners or by coroners.

The foregoing statistics for the year 1907, having been derived from returns furnished quarterly by the local registrars, are subject to revision when the causes of death and other details shall have been finally classified and tabulated for publication in the Registrar-General's Seventieth Annual Report, which is now in course of preparation.

THE ATTACK ON INFANTILE MORTALITY.

THE great mortality among infants is one of the many public health problems waiting to be solved. Although much has already been done by medical officers of health, other more urgent problems have prevented any very large amount of time being spent on preventative measures against infantile mortality. In recent years this important subject has been attacked from more than one side, as shewn by the following references to work in various places. In the general movement towards the co-ordination of the public health and other medical services, the close connection between the work done on infantile mortality and the work of the school doctor under the Education (Administrative Provisions) Act, 1907, should not be lost sight of. A large mass of information will be collected by the health visitors and other agencies, under the supervision of the medical officer of health, referring to the methods of feeding of the health of, and the diseases or other ailments of the infants who, in the course of the next four to six years, will be presented for medical inspection to the school doctor. The information previously obtained should then be readily available, thus saving both time and trouble.

The various reports, from which the following accounts have been derived, show how admirably voluntary help can be fitted into local municipal effort, and further, what a large amount of work lies open to doctors, workers and inspectors of the gentler sex in a field peculiarly their own, and in which, therefore, they need fear no competition from men.

ST. PANCRAS.—A small paper-covered book, with the title, "A School for Mothers," has just been published. It is written by four ladies—Miss Bunting, Dr. Bunting, Miss Barnes, and Miss Gardiner—and has an introduction by Sir Thomas Barlow, and a chapter by Dr. Sykes, the Medical Officer of Health of St. Pancras. Herein is set forth the scheme which has been worked since the summer of 1907, on voluntary lines, in harmony with the already existing municipal work. The book describes the method adopted to combat the evils of infantile mortality in this locality. In Dr. Sykes's own words (p. 8): "Since 1904 our work in St. Pancras has been based upon the physiological law that 'infant life is dependent upon the mother from nine months before birth until nine months after birth, and the mother has been made the centre round which all the agencies revolve for the protection and preservation of the health of both mother and child.' The Borough Council have done as much as their powers permitted. Special advice has been sent to the mother of every infant born, and personal visits made at the home. To extend these measures for the prevention of infantile mortality, the Hon. Mrs. Bertrand Russell and Miss Bunting started the St. Pancras Mothers' and Infants' Society, one of the chief features of which was the formation of a School for Mothers, on the lines of a similar organization at Ghent, in Belgium. The main idea is to teach the maternal duties to every mother in as practical a manner as possible. The expectant mother is provided with a wholesome midday meal at a small cost (1½d.), which is only remitted after close inquiry. The dinners are utilised as object-lessons in the economic provision and preparation of nourishing food. A provident maternity club provides special advantages for those who join early in pregnancy. Infant

consultations and fortnightly weighings give the opportunity for personal instruction in elementary infant hygiene. Practical lessons in the washing and clothing of infants, and other useful and economic hints, e.g., the use of a banana crate as a cradle, bring the lady voluntary helpers into frequent sympathetic touch with mothers whose infants must benefit thereby to a large extent. It is as yet too early to gauge any results in figures, but such sound educational work must, in the long run, bear good fruit.

HUDDERSFIELD.—The Huddersfield scheme, in connection with which the name of the late Mayor (Mr. Benjamin Broadbent, J.P.) will long be remembered, is clearly set forth in a small pamphlet issued from the Public Health Department of the County Borough of Huddersfield, in October, 1907. The principal is "Help the mother to nurse her infant herself in her own home." It is thus seen that the scheme is not so complete as that started at St. Pancras, where the education of the mother in her duty to the child is begun *before the child is born*. By a special Act (1906) there is compulsory notification of births to the medical officer of health within 48 hours. The home is visited by a lady assistant medical officer of health, advice is given, and appropriate action taken where necessary. "The first visit by the lady doctors is followed by repeated visits in all cases where the circumstances call for them. It is at this point that the utility of the Voluntary Association comes into play. For the purpose of this Voluntary Association the Borough is divided up into separate districts, corresponding as far as possible with the wards, but taking as a basis for a separate district the number of births; about 150 births per annum is the approximate number for one district. Over each of these districts is appointed a lady superintendent, and with her are associated a group of lady helpers, varying in number in proportion to the number of babies likely to be born; it is not reckoned that any one lady helper should have more than 15 to 20 babies on her list." It is a rule that no dole shall be given in any shape. The infant mortality figure has shown a considerable decline in Huddersfield, but whether this can be entirely attributed to the operation of the scheme just detailed, it is as yet too early to say. There can be no question, however, that the work must be productive of good, and the successful co-operation between the voluntary and paid workers must be very gratifying to Dr. Moore, who is responsible for the efficiency of the preventative measures taken.

STAFFORDSHIRE COUNTY COUNCIL.—In his annual report for 1906, Dr. George Reid, the medical officer of health, says (p. 13), in reference to the causes of the excessive infant mortality, "Experience, I fear, compels one to come to the conclusion that it is hopeless to attempt to educate the present race of mothers. At the same time, some good in this direction may ultimately result from the administration of the Midwives Act, for a midwife has great influence over mothers, and sound advice given during the early weeks of the child's life, must, occasionally, at any rate, bear fruit. No real headway will be made, however, until the rising generation of both sexes are systematically taught elementary health principles at school. The first step in this direction is to educate the teachers, in order that they may be able to give necessary instruction." No one would quarrel with the latter part of this opinion. Yet it results in an attack on the

problems of infantile mortality by methods quite different from those used by the medical officers at St. Pancras and Huddersfield. This diversity of attack is one of the beneficial results of independent action, and the victory will come all the sooner if other carefully thought out schemes are adopted in different localities. For the last two years (1905-6) Miss Curwen has been engaged by the Staffordshire Education Committee in conducting classes in practical hygiene for the school teachers. The work has been very successful, and has progressed rapidly. A two-year course has been arranged, enabling students to take the examination of the Royal Sanitary Institute in two portions, one at the end of the first year, and the other at the end of the second, or they may wait and take both portions together. The whole course is so arranged that students can start in the middle, that is at the beginning of the second year. Various reports and letters to Miss Curwen indicate that already good results have been achieved.

BIRMINGHAM.—In December, 1907, a circular was issued appealing for funds for the Birmingham Infants' Health Society, which has been formed "to deal with 'some of the causes of the high rate of infant mortality 'which persists in parts of Birmingham.'" The work is rightly to have a modest beginning, and will be confined to the Floodgate Street area of the city. "Infant 'Consultations' will be held weekly by the honorary 'physicians of the Society in rooms that have been 'rented for that purpose in River Street. Medical 'treatment will not be given, only advice upon infant 'rearing; cases of illness will be referred by the 'society to suitable medical agencies. In addition to 'the 'Consultations,' a staff of efficient voluntary lady 'workers will visit regularly in the district to watch and 'report upon the progress of the children. There will 'be weekly 'At Homes' for newly-married women and 'mothers with young children, when talks on health, 'and instructions in sewing, cooking, home nursing, 'etc., will take place."

PROCEEDINGS OF THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

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

A GENERAL Meeting of the Incorporated 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, February 14th, 1908. *Present:* Drs. S. C. Lawrence, Alex. Graham, Randle Harper, J. W. Hembrough, C. Sanders, H. M. Beach, J. W. Mason, F. E. Fremantle, D. S. Davies, Herbert Jones, E. W. Goodall, P. C. Smith, A. W. Harris, J. A. H. Brincker, F. J. Allan, M. Young, J. C. Jackson, T. M. Legge, S. Rideal, L. C. Parkes, W. Butler, J. D. McCrindle, C. F. Stovin, G. F. McCleary, W. A. Bond, J. E. Robinson, Sir Shirley F. Murphy, Mr. Wolf Defries, Captain Fawcus, Major Blackham, Lieutenant-Colonel A. M. Davies, Lieutenant-Colonel R. H. Firth (members); and Captain D. J. Skelton, Messrs. W. Chalmers, M. W. Blyth, E. T. Kingzett, K. Taylor, W. Partridge, T. H. Lloyd, J. T. Ainslie Walker, Drs. D. Somerville and R. T. Hewlett (visitors).

Dr. D. S. DAVIES, in taking the chair, in the absence of the President (Dr. George Reid), said he had received a letter to the effect that, although Dr. Reid was making steady progress towards recovery and was able to get up a little each day, it would be some time yet before he would be able to attend the meetings of the Society. He was sure they would be glad to hear that their President was on the way to recovery.

MINUTES.

It was resolved that the Minutes of the last general meeting, having been printed and published in PUBLIC HEALTH for February, 1908, be taken as read and be confirmed, and they were duly signed by the chairman.

Dr. HERBERT JONES (Hon. Secretary) said that, with the exception of letters regretting inability to be present, there was no correspondence.

ELECTIONS.

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

AS FELLOWS.

Adams, John Andrew, M.B., B.Ch., Bank Royd, Sowerby Bridge	<i>M.O.H. for</i> Sowerby Bridge U.D.
Brehner, Charles Stuart, M.D., D.P.H., Widnes, Lancs.	Widnes M.B.
Buchen, George F., M.D., D.P.H. Municipal Offices, Birmingham	Birmingham, C.B. (Assist.)
Esmonde, John, L.R.C.S.I., Thur- goland, Sheffield	Penistone R.D.
Wiltshire, Herbert Pattison, L.R.C.P., M.R.C.S., Hemsworth, Wakefield	Hemsworth R.D.

AS MEMBERS.

Gray, W. L., M.B., Major (R.A.M.C.), 13, Elliott Street, Plymouth.
Wood, Andrew Hamilton, M.D., D.P.H., Fever Hospital, Little Bromwich, Birmingham.

The CHAIRMAN: Before we proceed with the business, I feel in a particularly happy position in being able, so shortly after we congratulated the Society upon the appointment of Dr. George Newman to the Board of Education, to announce that Dr. Newsholme has been appointed Chief Medical Officer to the Local Government Board, and I am sure you will desire to join with me in congratulating Dr. Newsholme on his appointment. We all feel that it is not only an honour to our Society, but that a very wise choice has been exercised by the Government; and I move that the congratulations of the Society be conveyed through the hon. secretary to Dr. Newsholme.

The motion was seconded, and carried amid cheers.

Dr. F. E. FREMANTLE desired to call attention to a case which he thought might very well be taken up by the Society. It had reference to the office of medical officer of health to the Corporation of Calcutta, one of the largest and most influential appointments in the medical profession throughout the Empire. In circumstances which created grave dissatisfaction, Professor Simpson, after

twelve years' good work, was discharged from that office in 1896. Dr. Neild Cook was then appointed to the position, which he retained for ten years. There was no reason why he should not have held it longer, but during that time he had been outspoken in his reports, and that outspokenness had caused a great deal of dissatisfaction among the Commissioners of the Municipality of Calcutta, under whom Dr. Neild Cook directly served. Consequently he was dismissed from office. Dr. Neild Cook had since petitioned the Viceroy, asking that the circumstances of his case should be considered in their wider bearing, as affecting the health and welfare of Calcutta, and that His Excellency would cause full inquiry to be made, so that his good name could be cleared and the existing law modified in order to give future health officers fixity of tenure as long as they performed their duties satisfactorily. Dr. Neild Cook had now given up public health work, and found a remunerative appointment in India in private work. Therefore the question might be taken up purely and solely in the public interest; and he thought that, if this Society set itself to watch over the interests of the profession throughout the Empire, they might take steps to have this case raised in the Imperial Parliament. He had reason to believe that the matter had been referred to the authorities at Whitehall, but he felt that it demanded further publicity. He moved that the matter be referred to the Council, with power to act.

Dr. A. W. HARRIS seconded.

The HON. SECRETARY suggested that, as the Council did not meet again until April, the matter might be referred to the Standing Committee of the Council, which had power to deal with matters of this kind.

Dr. F. E. FREMANTLE amended his motion accordingly, and it was carried in this form.

Dr. F. E. FREMANTLE then raised the question, of which he had given notice at the last meeting, as to how far they could enlist among their ranks the sanitary officers of the Army Medical Corps and Indian Medical Service, and those holding similar appointments in the Royal Navy. He believed there was no definite arrangement for their admission into the Society at the present moment, and that there were only two or three such officers on their roll. He thought the Society would gain very largely if it were definitely stated that gentlemen holding these appointments were eligible as Fellows.

The HON. SECRETARY explained that, under the Articles of Association, Fellows must be medical officers of health, acting or retired, but the question had been before the Council for two or three years, and it had been decided that for the purposes of this Article, members of the Royal Army Medical Corps, who were specially attached to the sanitary services, were medical officers of health, acting or retired, and, therefore, eligible as Fellows of the Society.

Dr. F. E. FREMANTLE expressed his satisfaction with the hon. secretary's explanation.

Professor KENWOOD then read a paper entitled "Some Observations upon Disinfection."*

* Published in the present issue.

North-Western Branch.—A meeting of the above Branch was held at the Chemical Club, Victoria Hotel, Manchester, on Friday, the 10th January, 1908. *Present:* Dr. A. E. Brindley (President), in the Chair; Drs. Sergeant, Garstang, M. Young, Hope, Welsh, Hibbert, Wilson, Bentham, Tattersall, Brehner, Wilkinson, Paddock, Beard, Hamilton, Hindle, Pilkington, Greenwood, Buckley, Wheeldon, Hitchon, Kingsford, Berry, Chadwick, Chronnell, James Marsh, R. Young, Dearden, Niven, Buchan, Dowling, Fisher, J. A. Harris, Talent, Fraser, J. W. Cook, Deans, Hulbert, Edlin, Thomas, Martin, H. E. Watkins, Stephenson, and T. B. Flint.

Letters of apology for absence were read from Drs. Coutts, Vacher, Wheatley and Barlow.

The minutes of the last meeting were read, confirmed and adopted.

The President, on behalf of the Members of the Branch presented Dr. Meredith Young with a handsome set of dessert knives and forks in recognition of his services as Honorary Secretary.

Dr. Young warmly thanked the Members of the Branch, for this totally unexpected mark of appreciation for what little services he had been able to render.

Dr. H. E. Corbin, Medical Officer of Health for Stockport, was nominated for election as a Member of the Branch.

Dr. ALFRED GREENWOOD then opened a discussion on the recent Memorandum of the Board of Education on the Medical Inspection of School Children, which he characterized as the "Children's Charter of Health."

Dr. C. H. TATTERSALL stated that the greatest factor in the administration of the suggestions contained in the Memorandum was the expense involved. He had observed in the perusal of Dr. Kerr's reports to the London County Council continuous remarks as to the want of sufficient staff to make his work effective. In Salford they had 40,000 school children, and to inspect these on Dr. Kerr's lines would mean a staff of at least 12 inspectors. This he could not hope for, and, therefore, a good deal of the work would have to wait until the public got educated up to it. The suggestion was made that there must be co-ordination and combination between the education authorities and health authorities in this matter; the experience of the United States, of which he had personal knowledge, showed that there need be no friction with education authorities if tact were observed, even in places where the officers were quite separate; but to his mind the combination with the work of a medical officer of health was most advantageous, because of having the staff of the health department available for dealing with the conditions found. In New York, the city with which he had the most acquaintance in this matter, there were roughly 400,000 children with 160 part-time medical inspectors, and with a staff of medical men in the health department also available. They were paid, he believed, a salary of 1,000 dollars each, and their experience was, he had no hesitation in saying, that this part-time work was unsatisfactory. As a Member of the Salford Branch of the Manchester Medical Guild, he

concurred with the resolution of that Branch, that it was inadvisable to appoint anyone in private practice as a school medical inspector.

Dr. E. W. HOPE agreed with the suggestion of the Board of Education that local authorities should take time to decide as to what scheme their particular district demanded, and proceed cautiously, doing a little at first, and developing afterwards on the same lines as those on which they had started. As to the question whether part-time men or special men should be appointed for medical inspection purposes, Liverpool had decided upon the opposite system to that in force in Salford. One of the reasons which had swayed them in coming to this conclusion had been the somewhat sentimental one, that if they did not employ general practitioners they would be in a way advertising to the general public that the medical profession did not agree *inter se*. They might, however, alter this in course of time, and go upon the Salford lines. It was hardly fair, in his opinion, that a matter of this description should be referred to general practitioners, for they had not heard much about it, and had no special experience in it. Their business was the treatment of disease, and there was only the very faintest suggestion as to treatment made in the Memorandum. On this question of treatment, he inclined to the idea that they should stimulate parental responsibility, and if the parents would not take their children for treatment to hospitals or dispensaries, they should be punished in some way. As regards the part to be taken by the medical officer of health in school inspection, he concurred with the Memorandum and with Dr. Greenwood's interpretation, although the Medical Officer of Health's Department should be strengthened to meet the demands which would probably prevail upon it. They did not want a mere record of defects to be made in a book, for the probability was that, as soon as the defects were entered, the book would be closed, and remain closed, and no benefit would accrue. His staff in Liverpool had for many years been in close relationship with the school teachers, and actually for 12 years intimations as to the health of school children had been sent from the Health to the Education Department. This work had been increasing enormously, for, on looking up his files, he found that the number of intimations so sent about 12 years ago was only some 12,000 per annum, whereas now it had grown to 40,000 per annum; a fact which, to his mind, proved the organic relationship between the two bodies, and shewed that mischief would ensue if this system were disturbed.

Dr. EDWARD SERGEANT said that they were now realising something for which the Society had fought for many years. As a county medical officer of health, he was most concerned to know what position would be taken by the medical officers of health of the smaller districts. Could they use the local medical officer of health? He thought it was not intended by the Memorandum that these medical officers should be left outside. Another way in which the Act might be worked would be to have education areas mapped out in the county; but if this were done, he thought the

choice of a medical inspector should be made with the greatest caution, for if one of the local medical officers of health out of about half-a-dozen in the area, were appointed special school inspector there might be friction with the others. On the whole, he thought it would be better to have a whole-time man for this work, or else appoint each medical officer of health school medical officer in his own district.

Dr. JAMES NIVEN wished to emphasize that portion of the Memorandum which advocated the appointment of county medical officers of health for every county. Personally, he would concentrate on that. New acts were constantly being passed imposing work on sanitary authorities, and, in spite of the continuation of this, there was no co-ordinate authority thought about. The experience of the Midwives Act was shewing day by day that a regrettable state of affairs would probably soon ensue. The present regulations were gradually chalking off midwives, and there was a lack of educated women to take up their work, especially in rural districts. They required a more local co-ordinating authority for this as for education work. He begged to propose a resolution that "in the opinion of this Branch, it is now urgently needed that county medical officers of health should be appointed for every county in England and Wales, and that the Incorporated Society should take this question into their immediate consideration."

Dr. H. O. PILKINGTON was strongly of opinion that the work should be under the control of the medical officer of health, especially in county boroughs, because the communication at present was so close that they must not risk its being broken. The only question which occurred, to his mind, as being difficult of solution, was whether it was better that the medical officer of health, who could not himself do the work in these areas, should engage private practitioners who knew children and their diseases to do the inspection, or whether they should have one or more assistant medical officers of health to do the work, and to give their other time to the services of the health department.

Dr. COOTE HIBBERT said that the Memorandum made no suggestion as to whether any assistant, who might be appointed a medical officer of health to a large borough should be appointed by the Education or the Health committee. He thought that smoother working would result if the Health Committee made the appointment, and left it open to an assistant so appointed to fill in his time by doing other work for the health department. He would like to ask whether, in the opinion of the meeting, an assistant medical officer of health residing at a fever hospital would be a suitable person to carry out the work.

Dr. J. J. BUCHAN said that he had carried out the work of medical inspection in regard to one-third of the children in his town during the last year. He did not find the expense so great as some of the speakers had suggested. He had advised his committee that they could examine all the children attending schools in the town during the next two years. He thought that in county

boroughs the medical inspector of school children must be a whole-time man appointed by the health department. As regards the visitation of the homes of the children, he had been particularly struck with the necessity for this; for example, in a case of scabies, which occurred only last week, the disease had been treated without success for some time, and on visiting the home the secret of this non-success was readily discovered, for it was found that the one case which went to school was only one of six cases in the home. When these were dealt with, the whole were readily cured.

Dr. WHEELDON stated, that he had carried out the joint work of the medical inspector for 14 months now, dealing with 27,000 children, and he was a part-time man. He did not think the work would be difficult. The teachers in future would assist very largely with it; for example, in weighing and measuring the children. In his opinion, any necessary treatment could be carried out without any friction with the other medical men, because those cases which required treatment were cases of illness due to dirt and infection. Cases which were now treated publicly by most health departments, and cases, moreover, which occurred amongst the poorer classes, did not use the medical practitioners very much for anything. A suggestion which had been made that each medical man should inspect his own patients was absurd. He would suggest the co-operation of a nurse to take out particularly communicable diseases.

Dr. MARTIN suggested that part-time medical officers of health should do this work in their own districts, and the county council authority should only supervise or visit occasionally as they at present did in ordinary public health work.

Dr. NIVEN's resolution having been seconded by Dr. Sergeant, was put to the meeting and carried *nem. con.*

Dr. TALENT urged that the part-time medical officers should not have the work taken out of the town; that it should either be done by the medical officer of health, or divided up amongst the general practitioners in the town.

Dr. JAMES MARSH thought that the whole thing should be done by the medical officer of health in non-autonomous districts with tact, and he thought if most medical officers of health had a fair share of that, there would be no friction. He was also a certifying factory surgeon, and he had frequently to detect dirty and verminous children, and to send them to their own medical man for treatment, and, so far, no friction had ensued. He proposed that the work of the medical inspection of school children in non-autonomous districts should, wherever possible, be under the control of the local medical officer of health.

Dr. DOWLING seconded the resolution, stating that he thought only the best results would accrue from this.

Dr. CHADWICK said that the problem was very different in rural districts from what it was in towns. In small urban and rural districts the medical officer of health was the only one who knew of the sanitary conditions, and he thought that the work in the greater part should be added

on to that of the local medical officer of health. The teachers would undoubtedly help by measuring, and by doing most of the clerical work. In places where this was not possible, general practitioners should be used. There was no more friction to be feared from their employment than there was in the case of vaccination, and in the case of certifying factory surgeons.

Dr. T. FISHER supported the resolution proposed by Dr. Marsh. He had repeatedly visited the schools, and had obtained valuable help from teachers, and from nurses from the local nursing association. If an outsider were appointed, he would be bound to encroach upon some of the duties of the medical officer of health.

Dr. THOMAS said that they had overlooked one factor, viz., the status of the teachers, which he thought was different in the provinces from what it was in London. In the latter place, the teachers were the prime movers in finding out illness. He would like to know, with reference to Dr. Buchan's inspection, what details were obtained, and what degree of exactitude was obtained; were the eyes and ears, for example, thoroughly tested?

Dr. GARSTANG also supported the resolution. In small country districts, in his opinion, as distinguished from large towns, the medical officer of health should be supreme. County education areas were not practicable for this purpose in his opinion, for the education sub-committees were small bodies picked out by the county councils, with no regard whatever to sanitary areas, and overlapping was frequent. In his own district, there were four sanitary areas and one education area. He thought some official recognition of the sanitary area was desirable, for it was already worked by properly qualified officers. The local medical officer of health undoubtedly should be given first chance of doing this work, but he would stop at diagnosis, and draw the line at home treatment.

Dr. EDLIN stated that, as a part-time man for a small urban district, he could not do the work unless he sacrificed his private practice, but if adequately remunerated he would not hesitate to drop private practice and take this up, for he was so convinced of the necessity for some specialist carrying it on.

The resolution proposed by Dr. MARSH was carried *nem. con.*

Dr. GREENWOOD then briefly replied to the discussion, and stated that he had drawn attention to the necessity for co-operating the teachers with them in this work. As regards Dr. Hibbert's questions, he thought the education committee should make the appointment, and that they should appoint a whole time man, and make it one of his duties to assist the health department during his long holidays. As regards the residence of an assistant at a fever hospital, he thought public opinion was very much too strong against this, even though, as medical officers of health, they knew that adequate precautions could be taken. He would only remark, in conclusion, that whoever did the work, if he were in general practice, it should be laid down as an absolute rule that he should never visit the homes.

CORRESPONDENCE.

THE STANDARDISATION OF DISINFECTANTS.

To the Editor of PUBLIC HEALTH.

SIR,—I much regret that, owing to the lateness of the hour, I was unable to take part in the discussion on Dr. Kenwood's paper on February 14th, and I hope you will allow me to make the following remarks.

I am glad that Professor Kenwood is in agreement with Dr. Rideal that attempts to evolve any single routine bacteriological test to apply to the very divergent circumstances obtaining in every form of disinfection are foredoomed to failure. This is what Dr. Sommerville and I enunciated in PUBLIC HEALTH, March, 1906: "Attempts to embody in the standardisation of disinfectants all conditions that obtain in practice must be futile, etc." But I fail to see how he can reconcile this position with his statement that the scheme recommended by the Lister Institute appeals to him as a wise and practical one. The use of faeces in a standard test cuts out all possibility of uniformity of results amongst workers in different laboratories, as Dr. Martin has himself admitted. I doubt very much whether it is possible to obtain anything like uniformity, even at the Lister Institute, with the large stock of faecal matter in powder which I understand is stored there at the moment. Certainly, when that stock runs out, different results will be obtained. But even assuming that further "parcels" of even uniformity were forthcoming, it is surely the height of absurdity to put forward such a suggestion in connection with any method of standardisation, which, to be of any value, must admit of universal application. Professor Kenwood quotes experiments by Klein, Fowler, Blyth, Hewlett and himself on the lowering of the carbolic acid co-efficient by the introduction of organic matter, and refers to results obtained by Hewlett and himself from work done on faeces. Everyone is agreed that organic matter lowers the co-efficient; but I wish to point out that the faeces experiments referred to are anything but satisfactory; for it has been demonstrated (*Sanitary Record*, May 9th, 1907) that the particulate matter in all such experiments is proved to contain living organisms, even after the faecal matter has been in contact with the disinfectant for half-an-hour. Dr. Sommerville and I did some work in the spring of 1905, which was published in PUBLIC HEALTH, February, 1906, shewing the drop in co-efficients when urine is added to the watery solution of the disinfectants. We have repeated that work many times since, and we believe that, for the disinfection of typhoid urine, it may be accepted as quite reliable.

It is to be regretted that Professor Kenwood did not publish his results obtained with pus, as it would have been possible then to compare notes; but I may state that results of experiments carried out in my laboratory on different types of pus, are so variable that no useful knowledge can be derived from them.

With reference to the regulations in Victoria, it should be noted that the time allowed for disinfection is not mentioned. This is a serious oversight; for if sufficient time be given to a poor disinfectant, it may in the end appear to compete favourably with a most efficient one, when the latter acts for only a fraction of that time, e.g., a twenty-four hours' contact with weak vinegar might give apparently excellent results, yet no one would seriously think of putting forward such a solution in practice.

Dr. Sommerville and I have recently worked with dilutions of disinfectants made with 1 per cent. gelatin and starch (0.5 per cent. Coignet's gelatin and 0.5 per cent. rice starch), obtaining constantly uniform results. By the use of starch, the influence of absorption in connection with particulate matter is admitted, and the drop in the co-efficient is uniformly registered, as demonstrated by the following table:—

Disinfectant.	Diluent— Water containing no organic matter.	Diluent— Water containing half per cent. gelatin and half per cent. starch.
A.	16.4	14.5
	16.5	14.5
	16.5	14.6
B.	10.0	7.0
	10.0	7.0
	10.4	7.0
C.	12.2	0.3
	12.0	0.3
	12.0	0.3

The statement that the finer the emulsion the greater the germicidal power is only partly true, for below a certain point the fineness of the emulsion decreases the efficiency; and this is explained by the fact that very fine emulsions approach the condition of solution, which, other things being equal, is now admitted to be much inferior to that of emulsion.

I am, Sir,

Yours faithfully,

J. T. AINSLIE WALKER.

February 18th, 1908.

A CASE OF DIPHTHERIA IN A HORSE.

To the Editor of PUBLIC HEALTH.

SIR,—I was much interested in the account given by Dr. Alfred Robinson, in the February issue of PUBLIC HEALTH, of a case of diphtheria in a horse.

A similar instance came under my notice in 1900. I was visiting a house in connection with a case of diphtheria in a child, and on making inquiries as to illness amongst any animals kept on the premises, I was informed that a favourite pony of the child was ill. I examined the pony and found it to be suffering from some obstruction of the throat, indicated by great difficulty in

breathing, with insuction of the chest wall; at the same time there was a foul purulent discharge from the nostrils. Without much expectation of finding the Klebs Loëffler bacillus I took some of the discharge and inoculated a blood serum tube; the result, however, was a typical growth of true diphtheria bacilli.

Not having before heard of the occurrence of diphtheria in horses, I forwarded the culture, and also some serum I obtained from the pony, to Professor Woodhead, at Cambridge University; these were examined by Dr. Louis Cobbett, who was able to confirm the diagnosis by injection into guinea-pigs.

I believe Dr. Cobbett subsequently published a note of the case in the *Lancet* and *Centralblatt für Bakteriologie*.

Yours etc.,

A. MEARNS FRASER,

Medical Officer of Health

The Town Hall, Portsmouth,

February 20th, 1908.

RECENT PUBLIC HEALTH LITERATURE.

Bacteriuria.

BUCHAN (J. J.). Bacteriuria in enteric fever. *Liverpool Med. Chir. Jour.*, 1908, *xxix*, 166.

Bromin.

KINNAMAN (G. C.). The anti-microbic action of bromin. *Jour. Amer. Med. Assoc.*, 1908, *l*, 345.

Cyto-diagnosis.

SAWYER (J. E. H.). The value of cyto-diagnosis in practical medicine. *Lancet*, 1908, *i*, 283.

Digitalis.

SOWTON (S. E. M.). Some experiences in the testing of tincture of digitalis. *Brit. Med. Jour.*, 1908, *i*, 310.

Dysentery.

KRUSE (R.). Recent investigations on dysentery. *Med. Press*, 1908, *i*, 175.

Filariasis.

LOW (G. C.). The unequal distribution of filariasis in the Tropics. *Lancet*, 1908, *i*, 279.

Food, Preservation of.

BEVERIDGE (Maj. W. W. O.). On the use of potassium nitrate as a good preservative; with some methods of analysis. *Jour. Roy. Army Med. Corps*, 1908, *x*, 124.

Hygiene, Public.

SMITH (C. D.). The problems of State Boards of Health. *Jour. Amer. Med. Assoc.*, 1908, *l*, 85.

Infant Feeding.

ARMSTRONG (H.). Some notes on infant feeding. *Med. Press*, 1908, *i*, 151.

Infectious Diseases.

ROBERTSON (J.). The prevention of the commoner infectious diseases. *Birm. Med. Rev.*, 1908, *lxii*, 308.

Inoculation.

LONGCOPE (W. T.). Notes on experimental inoculations of monkeys with glands from cases of Hodgkin's disease. *Univ. of Penna Med. Bull.*, 1907, *xx*, 229.—PFEIFFER (R.). Ueber Schutzungsung des Menschen bei Typhus, Cholera and Pest. *Cent. f. Bakter.*, 1908 (Ref.), *xl*, 705.

Life Assurance.

BARR (Sir J.). An address on some of the medical aspects of life insurance. *Brit. Med. Jour.*, 1908, *i*, 241.

Malaria.

ROSS (R.). The prevention of malaria in British Possessions, Egypt, and parts of America. *Jour. Roy. Army Med. Corps*, 1908, *x*, 155.

Meat, Inspection of.

DIXON (J. A.). Meat inspection. *Jour. Roy. Inst. Pub. Health*, 1908, *xvi*, 96.

Meningitis.

CLAYTON (T. A.). The etiology and symptomatology of cerebro-spinal meningitis. *Amer. Jour. Med. Sciences*, 1908, *cxv*, 214.—ROBB (A. G.). The treatment of epidemic cerebro-spinal fever by intra-spinal injections of Flexner and Jobling's Anti-meningitis Serum. *Brit. Med. Jour.*, 1908, *i*, 382.

Mortality.

GOLDSBOROUGH (F. C.). The maternal mortality in the first 5,000 obstetrical cases at the Johns Hopkins Hospital. *Johns Hopkins Hosp. Bull.*, 1908, *xix*, 12.—GUILFOY (W. H.). The death rate of the city of New York as affected by the cosmopolitan character of its population. *Med. Rec., New York*, 1908, *lxxiii*, 132.—TURNER (F. M.). Is the death rate the best measure of severity in disease? *Lancet*, 1908, *i*, 413.

Ophthalmia Neonatorum.

JONES (H. E.). Ophthalmia neonatorum, with especial reference to its prevention. *Liverpool Med. Chir. Jour.*, 1908, *xxix*, 214.

Opsonins.

BEEBE (T. C.). Practical applications of opsonic therapy. *Boston Med. and Surg. Jour.*, 1908, *clviii*, 37, 85.

Plague.

BLUE (R.). The conduct of a plague campaign. *Jour. Amer. Med. Assoc.*, 1908, *l*, 327.—GILL (C. A.). The epidemiology of plague; with special reference to its mode of spread and the means by which it may be combated. *Lancet*, 1908, *i*, 213.—HAFFKINE (W. M.). On the present methods of combating the plague. *Proc. Roy. Soc. of Med. (Epidem. Sect.)*, 1908, *i*, 71.—THOMPSON (J. A.). Protection of India from invasion by bubonic plague. *Proc. Roy. Soc. of Med. (Epidem. Sect.)*, 1908, *i*, 81.

Scarlet Fever.

NOBECOURT (P.) and P. MERKLEN. Etude sur l'élimination des chlorures et l'albuminurie au cours de la scarlatine. *Arch. de Med. des Enfants*, 1908, *xi*, 81.

Schools.

CLOUSTON (T. S.). The medical inspector of schools as a psychiatrist. *Brit. Med. Jour.*, 1908, *i*, 252.—PLEASANTS (J. H.). Prevention of the nervous and mental disorders incident to school life. *New York Med. Jour.*, 1908, *lxxvii*, 111.

Serum.

BAIL (O.) and E. HOKE. Theorie der Serumaktivitaet. *Arch. f. Hygiene*, 1908, *lxiv*, 313.—HORT (E. C.). The therapeutic uses of normal serum. *Lancet*, 1908,

Public Health

THE JOURNAL OF THE

Incorporated Society of Medical Officers of Health.

No. 2.

APRIL, 1908.

VOL. XXI.

THE CONTROL OF CONSUMPTION.

THE various problems relating to the control of consumption have lately been brought into prominence by the issue of Dr. Bulstrode's monumental report on "Sanatoria for consumptives and certain other aspects of the tuberculosis question." From this report we may gather that Dr. Bulstrode is disposed to attach but a minor degree of importance to case-to-case infection as a factor in the spread of consumption, and consequently, that he is not to be found in the ranks of those who in the attack on the disease rely chiefly on a system of notification. Dr. Bulstrode's views will hardly find ready acceptance among many of the medical officers of health who have paid special attention to the prevention of tuberculosis, and in the present number of this Journal we are able to place before our readers a statement of the case from another point of view by Dr. Niven.

From the etiological point of view the students of pulmonary tuberculosis may be ranged into three main groups, according to the relative importance they attach to the three factors: (1) exposure to infection; (2) debilitating surroundings; (3) hereditary predisposition or diathesis. And these etiological differences are far from being matters of mere scientific interest. All three schools of opinion are agreed that consumption is a disease that can and ought to be prevented; the "diathesian," no less than the "infectionist," calls out aloud for something to be done. The medical officer of health is unable to remain in an attitude of academic agnosticism towards these disputed questions. He has definitely to make up his mind on the evidence available, to form an opinion, and to express his opinion in terms of administrative action. That action will depend upon his etiological outlook. If he should conclude that case-to-case infection is the most important factor in the production of consumption, he will

naturally favour a notification scheme of increasing efficiency; if, on the other hand, he sees more danger in the existence of unwholesome conditions of environment, he will prefer to concentrate his efforts on attacking what is known collectively as "insanitation"; while, if he regards the inheritance of a special diathesis as the factor of cardinal importance, then he may rejoice in breaking ground in a region hitherto untouched by our methods of public health administration.

From the administrative point of view the differences between the first two schools are not insuperable. The most ardent advocate of compulsory notification must admit the importance of malnutrition and insanitation as predisposing conditions, and he must admit also that his notification system requires special modification to meet the special circumstance of the disease. Similarly, the most fervent believer in the prophylactic value of social betterment cannot deny that the limitation of indiscriminate expectoration and the destruction of tuberculous infection are matters that should not escape the attention of sanitary authorities. In both cases, what is wanted is nothing more than the development of administrative methods that are already to hand. But very different considerations apply to the believer in an inherited tuberculous diathesis as the all-important factor. Here our preventive methods, however modified, avail us nothing, and we seem compelled to choose between a policy of masterly inactivity and the adoption of a system of eugenics that appears to involve a far greater interference with individual freedom than the most stringent system of notification that has yet been devised. It behoves us, therefore, to be cautious in estimating the evidence for hereditary predisposition, and, above all, to guard against accepting the conclusions of statisticians, however eminent, that do not rest upon an adequate basis of verified facts.

G. F. M.

Sewage.

DORGAN (Capt. J.). The disposal of sewage water in India. *Jour. Roy. Army Med. Corps*, 1908, x, 135.—HART (G. A.). Discussion on modern methods of sewage disposal. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 1.—HART (G. A.). Description of the sewerage and sewage disposal works of Leeds, with special reference to the sewage disposal works and lands at Rodley. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 15.

Tobacco.

GUILLAIN (G.). Etude comparative de différentes méthodes permettant d'expérimenter la toxicité des Tabacs. *Arch. de Med. Experiment*, 1908, xx, 63.

Toxins.

NICOLLE (M.) and E. POZERSKI. Une conception générale des anticorps et de leurs effets. *Ann. de l'Inst. Pasteur*, 1908, xxii, 26.

Trypanosomiasis.

BOUFFARD (G.). La baléri, trypanosomiase animale des territoires de la bruche du Niger. *Ann. de l'Inst. Pasteur*, 1908, xxii, 1.

Tuberculin.

SMITHIES (F.) and R. E. WALKER. Calmette's ophthalmic reaction to tuberculin. Preliminary report based on 242 cases. *Jour. Amer. Med. Assoc.*, 1908, l, 259.—STADELMANN (E.). Ueber kutane und conjunctivale tuberculin-anwendung. *Deut. Med. Woch.*, 1908, xxxiv, 227.

Tuberculosis.

BUTLER (W. J.). Cutaneous tuberculin vaccination in the diagnosis of tuberculosis. *Med. Rec., New York*, 1908, lxxiii, 176.—BYERS (Sir J.). An address entitled, "Why is tuberculosis so common in Ireland?" with suggestions for its prevention and treatment. *Lancet*, 1908, i, 209.—INMAN (A. E.). Effect of exercise on the opsonic index of patients suffering from pulmonary tuberculosis. *Lancet*, 1908, i, 220.—McWEENEY (E. J.). The combat against tuberculosis in Germany, with special reference to working class sanatoria and dispensaries. *Med. Mag.*, 1908, xvii, 79.—MILLAR (J. G.). On the spread and prevention of tuberculous disease in Pondoland, South Africa. *Brit. Med. Jour.*, 1908, i, 380.—PEHN (M.) and J. CHALIER. De la tuberculose humaine congénitale. *Arch. de Med. des Enfants*, 1908, xi, 100.—ROBERTS (J. R.) and Ras Sahib P. R. BHANDARKAR. Preliminary note on the existence of an acute tuberculous fever in India, which has been confused with continuous and remittent fevers. *Brit. Med. Jour.*, 1908, i, 377.—WOOD (G. B.). The etiology of tuberculosis of the upper respiratory tract. *Laryngoscope*, 1907, xviii, 920.

Typhoid.

HARRISON (Maj. W. S.) and Lieut. A. D. FRASER. Typhoid bacilli and the water-bottle. *Jour. Roy. Army Med. Corps*, 1908, x, 133.

Typhus.

MANDELBAUM (M.). Fuer Typhusfrage in München. *Munch. Med. Woch.*, 1908, lv, 19.

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.

The Registrar-General's Weekly Returns. Annual Report of the Health of the Whitby U.D. by Dr. W. E. F. Tinley. Report of the Contagious Diseases amongst Natives' Commission, Transvaal. Annual

Report of the Maldon R.D., by Dr. John C. Thresh. Annual Report of Chelmsford, by Dr. John C. Thresh. Report of the L.B.H. for the City of Adelaide, by Dr. T. Borthwick. Minutes of the Metropolitan Asylums Board. Report of the Departmental Committee appointed to inquire into the Dangers attendant on Building Operations. Report on the Royal Borough of Kensington, by Dr. T. Orme Dudfield. Report on Delancey Hospital, Cheltenham. The Registrar-General's Quarterly Return. Health Report for the Borough of Sutton Coldfield, by Dr. A. Bostock Hill. Health Bulletin for the County Borough of Salford, by Dr. C. H. Tattersall. The Corporation of the City of Capetown (Minute of His Worship the Mayor). Bulletin of the State Board of Health of Maine. Dr. R. Deane Sweeting's Report to the L.G.B. on a recent Epidemic of Scarlatina in the Urban District of Burnham-on-Crouch (Essex), and on the measures taken with respect thereto. Dr. Reginald Farrar's Report to the L.G.B. on the Sanitary, Circumstances and Administration of the Emly, Farnley Tyas, Gunthwaite and Ingbirchworth, Hoylandswaine and Thurstonland Urban Districts, in the West Riding of Yorkshire, together with suggestions for the formation of Joint Sanitary Districts. Report of the Births, Marriages and Deaths in Ontario for year ending 31st December, 1905. Report to the L.G.B. on Inquiries with regard to the Wholesomeness of Tripe of Home and Foreign Origin, by Dr. A. W. J. MacFadden. Minutes of the Metropolitan Asylums Board. Report of the Midwives' Act Committee. Dr. Edward Sergeant's Report to the Lancashire C.C. Annual Report on the Borough of Reigate, by Dr. A. E. Porter, together with the Sanitary Inspector's (J. P. Humphry) Report. Annual Report of the Department of Agriculture of the Province of Alberta for 1905-6. Report to the Spalding R.D. on the Deeping Water Supply, by Dr. S. Herbert Perry.

Journals.

The Hospital. The Sanitary Record. La Technique Sanitaire. The Royal Sanitary Institute. Glasgow Medical Journal. Bulletin du Service de Santé et de l'hygiène. The American Journal of the Medical Sciences. The Journal of Tropical Medicine and Hygiene. Medical Review of Reviews. Journal of the Royal Institute of Public Health. The Birmingham Medical Review. The Municipal Journal. The Medical Temperance Review. The Transvaal Medical Journal. Giornale della Reale Società Italiana d'Igiene. The All-India Hospital Assistants' Journal. Water and Water Engineering. The Sanitary Journal. Pacific Medical Journal. The Canadian Practitioner and Review. Annales de Physico-thérapie.

Pamphlets.

A Plea for a Minister of Public Health. The Evolution of our Sanitary Institutions, by Dr. F. G. Bushnell.

Poor Law Orders.

By Herbert Jenner-Fust, M.A. P. S. King & Son, Westminster.

Enthetic Diseases.

By Robert R. Rentoul. The Walter Scott Publishing Company.

Transactions of The Epidemiological Society of London.

Williams & Norgate, London.

School Hygiene.

By Dr. Robert A. Lyster. W. B. Clive, London.

THE COMMUNICABILITY OF PHTHISIS.

By JAMES NIVEN, M.A., M.B.,

Medical Officer of Health, Manchester.

AT the request of the Acting-Editor of PUBLIC HEALTH, I am about to make some observations on the important and valuable report by Dr. Bulstrode on "Sanatoria for Consumptives, and on certain other aspects of the tuberculosis question," recently published as a supplement to the report of the Medical Officer of the Local Government Board.

Part II. of this report, which relates to the Sanatoria of England and Wales, and the results of treatment in them, is marked by that careful and luminous treatment, which we have learned to expect from Dr. Bulstrode, and supplies just the information which those interested in the work of English sanatoria desire to possess—so far as it can be supplied.

I do not propose, however, to comment on this part of the report, but on Parts I. and III. which are concerned chiefly with other aspects of the contest against tuberculosis. In this report the author has ranged over the whole field of preventive action. Nor is there any diffuseness in Dr. Bulstrode's large volume.

Every chapter is well and tersely written and is evidently the fruit of much reflection and of much compression. There is, it is true, little positive expression of opinion, yet the views of the author reveal themselves, or appear to do so, very distinctly.

Dr. Bulstrode looks to the increase in well-being of the English working classes for an explanation of the fall in the phthisis death-rate, and with the operation of similar causes in Germany he would couple the influence of the Insurance Laws. In this view I would generally concur. He sees in tuberculosis a disease which is proceeding rapidly towards extinction. This is, perhaps, somewhat sanguine.

But he is evidently inclined to regard the personal communicability of phthisis as a doubtful fact, and all procedures based thereon as somewhat in the nature of love's labour lost. There we disagree. No doubt there are often, but not always, factors which prepare the soil for the bacillus such as previous illness, poor physique, want of nourishment, alcoholic or other excess, mental depression, exhausting work, unwholesome surroundings, pulmonary irritation, and so forth. There are others, such as overcrowding, deficiency of

light and defective movement of air, which cannot in their nature be considered separately from infection.

It is to such factors, in so far as they subserve the upbuilding of the individual, rather than to direct infection as between man and man that Dr. Bulstrode would appear to look for the means of future betterment.

This impression is created, as must necessarily be the case, by the manner in which the various subjects are treated, and we turn first therefore to the successive chapters in Part I.

Dr. Bulstrode does scant justice, it seems to me, in his introductory chapter, to the penetrating genius of Villemin, or to the etiological argument by which he was guided to his experimental work, and which stands good at the present time.

Villemin points to the rarity of tuberculosis at great heights as a feature which it shares with many infectious diseases. "It is comparatively infrequent in the rural districts, and increases as the population concentrates, reaching a maximum in large towns." [This is a circumstance which has largely ceased to be true, probably because the effective concentration in the towns does not exceed that in the country to the extent which it used to do, and because of the improvement in housing and other conditions which has occurred.] "It is well known," he observes, "that phthisis is of extreme frequency in prisons, barracks, workshops and convents." Amongst prisons, he is especially alluding to penitentiaries, for he forthwith refers to the Millbank Penitentiary in London, of which Baly says that out of 355 prisoners released on account of sickness, ninety were phthisical, and three-fifths at least of these had contracted the disease in prison. "As proof that the disease was contracted in prison, Baly states that out of 5,249 prisoners incarcerated in 1844, and carefully examined, fifteen only, or 4.6 per 1000 had the disease on their arrival." (These figures are not in themselves conclusive, in the absence of a statement of the total from which the ninety cases were derived).

"The Imperial Guards in Paris and the Foot Guards in London alike sustained a very excessive mortality." There was, as Villemin points out, nothing common to these different bodies of individuals except the fact of a confined life in common. "On the other hand, the French troops in the Crimea, in spite of the excessive hardships which they underwent, suffered very little from phthisis."

The Bedouins living under tents are, he declares, free from the disease, but their immunity ceases when they come to dwell in the town in stone houses.

"M. Grillon, while attesting the freedom from phthisis of the Arabs of Hamman Meskhoutin, adds that the most disorderly morals and a filth inconceivable gave rise to cutaneous and syphilitic disorders, but not to phthisis."

Villemin then quotes various authors as showing the ravages which phthisis had caused when introduced among new peoples.

Power speaks of the recent introduction of phthisis amongst the inhabitants of Australia, New Zealand and Van Diemen's Land, and of the frightful ravages which it had caused amongst the last named. Ellis, quoted by Hirsch, says that at Tahiti, phthisis was not frequent up to a recent period. To-day it reigns with a frightful intensity, as well as in most of the islands of Oceania, where it carries off, according to Comeiras, about a third of the population. "One finds at every step," says the last named observer, "whole families a prey to a convulsive cough—young girls abandoned by their parents, phthisical people in different stages, reduced to a state of emaciation horrible to witness."

To these extracts from Villemin I will add a few words from an article by Dr. F. Grant Millar, in the *British Medical Journal* of February 15th, 1908, on tuberculous disease in Pondoland.

A young man goes up from this district to work in the mines at Johannesburg.

After working there for six months or a year—where, it must be remembered, the conditions of life are totally different to what he has been accustomed to—for example, the atmosphere of the mines, the dust, the hard work, etc., he happens to contract phthisis, as likely as not from a fellow-worker, after which he returns home to Pondoland, where the manner of living is pre-eminently calculated to favour the spread of the disease. Two main factors are the overcrowding of huts, and the filthy and disgusting habit of indiscriminate spitting.

The overcrowding is probably worse than anything that could be found in an East End slum of a great city at home. One may see some twenty people—men, women and children—crowded into a small hut, the door of which is carefully blocked up and which contains no other opening or ventilation of any kind. This overcrowding is very much the rule, it being quite the exception to find a hut not overcrowded. Now, imagine a phthisical patient one of this crowd, constantly spitting on the floor and on the walls of the hut, and can it be wondered at that the disease spreads.

No one who has lived in this country and seen nearly a whole hut of natives contract the disease one after the other, could possibly have any doubt as to the infectiousness of phthisis.

The conditions in some of our common lodging-houses were not very much better than this when I calculated the death-rate from phthisis at 20 per 1,000, being a quarter of the total mortality. These deaths were, of course, on no fixed population. But that is of little moment as the general conditions are much alike. Doubtless in one or two houses, the death-rate was much in excess of this figure.

Nor are we altogether unfamiliar with the spread of phthisis in a family living under conditions of squalor.

I do not understand what it is intended to imply by calling tubercular phthisis a sub-infectious disease. True, it acts slowly. The bacilli have, in general, to renew the attack many times before the host is overcome. But that does not prevent the infection from being widespread, or render the disease less formidable. In a similar sense, perhaps, plague is a sub-infectious disease. The term is, I think, unfortunate, as implying a degree of safety which does not exist.

I come now to the discussion of Cornet's work. (Report, page 18). Notwithstanding the conclusion of the English Commission, says Dr. Bulstrode, an opinion still prevails in the medical profession that tuberculosis of the human subject, whatever its degree, is due in the main to the drying of infected sputum, and to the inhalation of dust thus infected. No doubt we move slowly, and do not turn round so readily as we might.

But how do the findings of the Commission come into conflict with this opinion, against which they are supposed to operate? What Cornet established by his experiments was that dust taken from rooms inhabited by consumptives, careless as regards their sputum, when inoculated into guinea-pigs produced tuberculosis in 67 per cent. of the houses examined. Similar experiments carried out in Manchester by Dr. Coates, now Medical Officer of Health for Hornsey, under the guidance of Prof. Delepine, showed that, in 61 per cent. of like houses examined, the dust contained tubercle bacilli. The dust was collected from ledges, skirting boards, etc., and, in Cornet's cases, from bedsteads, in parts which could not have been reached by sputum directly, and had, therefore, presumably, been detached from dried sputum by treading and so forth. Dr. Coates' experiments were not mere repetitions of Cornet's. The method of collecting was varied, so as to obviate the objection taken against the wet

sponge. The effect of elevation above the floor was carefully noted. The influence of light (and ventilation) was assessed, and the experiments were controlled by samples taken from dirty houses, carefully ascertained not to have been occupied by consumptives within a recent period.

It was thus shown that, though the infective dust was most abundant near the ground, it was also to be found at a height of from three to six feet. It was, moreover, shown that the infectiveness of the dust was diminished in well lighted rooms, but not in all of these destroyed.

In the absence of destruction by light or dilution by currents of air, such dust may presumably remain infectious for months. "In almost direct contradiction to these results," says Dr. Bulstrode, "is the teaching of Flügge, who considers that his experiments and those of his collaborators have shown that infection is chiefly conveyed in the particles projected into the air in the act of 'violent coughing.'"

This view is largely based on the ease with which guinea-pigs are infected when exposed to the spray of a watery emulsion of tubercle bacilli, whether derived from cultures or from sputum, as contrasted with the difficulty experienced in infecting them with dried and powdered sputum blown into their cages.

Dried sputum, however, thus broken up, is not to be compared in regard of its fineness or power of penetration with the naturally selected finest dust used in Cornet's and Coates' experiments, which has been carried by currents of air to its place and even to a height of five or six feet.

In a review of the work done by himself and his colleagues in the *Zeitschrift für Hygiene*, Band XXX, Flügge concludes with an account of experiments by Heymann to determine the direct effect of coughing. It is evident that no slighter test will suffice, since a spray of watery emulsion of bacilli is in no way comparable with the particles detached from a sticky collection of mucus. In Flügge's words—

Yet we have succeeded in producing the infection of guinea-pigs, in an unobjectionable manner, by means of the matters ejected in the act of coughing by a phthisical individual.

The experiment was conducted by Heymann in this way. The guinea-pigs were contained in a room of the Hygienic Institute, which had been repeatedly disinfected, and which the phthisical patients entered in disinfected overgarments. Six to ten animals were used at once, and were placed

each in a specially constructed lead box, so fixed that their heads were necessarily turned towards the coughing person. The distance between the latter and the head of the animal was from twenty to forty-five centimetres.

The animals were coughed at by suitably selected patients every second day for three hours, and the individual experimental periods lasted from several weeks to a month. The result was that, out of twenty-five guinea-pigs which survived, six showed symptoms of inhalation tuberculosis. The course of the illness was surprisingly slow in these animals. It was noteworthy also that in some of these animals there were found only swollen and in part caseified bronchial glands, while in the streak preparations of these glands tubercle bacilli on several occasions could not be found. Presumably one had to do here with the scarce known infection from isolated bacilli, which even the very susceptible system of the guinea-pig was able to overcome.

The proof that the droplets ejected in coughing by the phthisical person is capable of producing infection is thus fully established from all points of view!!

But Flügge by no means denies the infectiousness of dust. Let us, he says, briefly sum up.

Infection will ensue—

1. In rooms in which phthisical sputum has dried on the floor or articles of furniture, and where the air is visibly filled with rather coarse dust, whether as the result of dry cleansing of the living room and ventilator, or as the result of the movement and of the various procedures of numerous men (workshops), or in consequence of continued mechanical vibrations.

Even under these circumstances it requires a continuous and rather long exposure to produce some probability of infection. The discharge of sputum into a pocket-handkerchief does not materially increase the danger.

2. In persons living with phthisical persons who cough and discharge droplets of mucus, if it is necessary to approach the coughing person with tolerable frequency within the distance of one metre, as in the case of nurses; in workshops, factories, clerical offices, and so on, where there is not a sufficient space between the positions during work.

I have given this extract in full, so as to show on what foundations the doctrine of infection by forcibly ejected sputum in the act of coughing rests. Do the above experiments prove that infection was from moist sputum and not from isolated dried bacilli?

It should be added that Cornet, in his recent work on tuberculosis, states that he placed a number of guinea-pigs at different heights over a floor infected with dried sputum, with the result that 47 out of 48 guinea-pigs became tuberculous.*

* Page 102 of "Tuberculosis, etc.," by Professor Dr. Georg Cornet. Translated and edited by Professor Alfred Stengel. W. B. Saunders & Co., 1904.

He also made some experiments on the forcible ejection of bacilli in coughing, and finds that a limited degree of infection may arise in this manner. But he attaches no great importance to this mode of infection.

So far as one can judge, this is the reasonable position. We teach consumptive persons always to use a piece of paper to cough into, but one does not regard this danger as other than the lesser one. The question is undoubtedly important, and, on reflecting over the kind of experience which would resolve it, it seemed to me that if one could discover animals spontaneously contracting tuberculosis in presence of dust, this would clear up the difficulty.

If now we turn to Koch's original communication in the *Mittheilungen aus dem Kaiserlichen Gesundheitsamte*, we find an account of the spontaneous occurrence of tuberculosis in guinea-pigs and rabbits, which seems to meet the case, and throws light on more than one question.

"Among many hundreds," says Koch, "of rabbits and guinea-pigs, which were purchased for experimental purposes, were so used and finally dissected, there never occurred one single animal which was tuberculous. Only after the infection experiments had begun, and a considerable number of tuberculous animals were being kept in separate cages, but in the same room with other experimental animals, did isolated cases of spontaneous tuberculosis occur amongst the latter. Yet distinct symptoms of tuberculosis almost never presented themselves in these, until they had been for three to four months in the same room with tuberculous animals. It was, moreover, very significant that, when the number of the artificially infected animals decreased, the cases of spontaneous tuberculosis declined also, and inversely. For a considerable period, during which very few tuberculous animals were kept in the cages for experimental animals, spontaneous tuberculosis entirely ceased among the remaining very numerous guinea-pigs and rabbits. The changes found in the animals dead from spontaneous tuberculosis are distinguished from those arising from artificial infection by very characteristic features, so that the different kinds and manners of the infection could be recognised with entire certainty. In animals suffering from spontaneous tuberculosis, one encountered regularly in the lung one or a few large tuberculous foci, in an advanced stage of caseation, accompanied by considerably enlarged and caseified bronchial glands. Sometimes, too, there were no foci of any size in the lungs, and only the bronchial glands were remarkably large, and filled with a cheesy material. Tuberculous changes in the other organs were, on the contrary, but little advanced. Artificially infected animals behaved differently, according as they were infected by subcutaneous inoculation, or by inhalation of

liquids containing bacilli. Usually inoculation was performed on one side of the abdomen, and in this case the glands lying nearest to the seat of inoculation were constantly considerably swollen and caseous. The bronchial glands, on the contrary, were almost always so small that they could scarcely be found. In these cases also the liver and spleen had undergone very extensive tuberculous invasion, while the tubercles in the lungs were yet comparatively small. In animals infected by inhalation, which had always received into the lung considerable quantities of bacilli, there were accordingly not one or a few large foci, but a very great number of small tubercles in the lungs. Keeping in view the experimental results in artificially infected animals, one must picture to oneself the spontaneous form of tuberculosis, as it occurred in guinea-pigs and rabbits under the conditions already mentioned as having been produced by the inhalation of one or a few infectious germs.

"Of animals which fell ill spontaneously in this fashion, I have examined seventeen guinea-pigs and eight rabbits, amongst them a wild rabbit, the only one out of ten of the same species which died (after a confinement lasting about three months) in an advanced condition of tuberculosis. All of these animals had in the portion of the lungs surrounding the cheesy foci a tolerably large number of bacilli, which were sometimes present also in extraordinary numbers. In the secondary tubercles the number of bacilli was usually smaller. It appears to me also to be worth mentioning that, on several occasions in the larger cheesy foci, the central degeneration had advanced very far, and, as a consequence, fully formed cavities were present, though of small extent. Up to a certain point, therefore, spontaneous tuberculosis produces in animals also conditions analogous to those of phthisis in man. The infection, however, does not remain localised for a sufficient length of time, but assails other regions so early, thereby causing death, that considerable cavities, such as occur in the human lung, cannot form."

I have quoted the above experience, because it appears to aid in deciding whether the conveyance of infection is by air-borne dust, or by moist bacilli-holding particles of sputum.

Here there can be practically no question that infection was not conveyed by food, or in any other way than by dust derived from the inoculated guinea-pig.

We learn, also, that a moderate amount of bacilli in light dust, if present for a prolonged period, is able in the long run to infect. It is as the result of repeated impacts from moderate or severe infections that one has learned to think of infection from man to man as occurring.

Indeed, so far back as 1890, I recorded the impression produced by direct etiological inquiry in these rather absolute terms. "Healthy

people do not contract phthisis, except after prolonged exposure to a well marked source of infection."

It is to be observed that these infections were due to a very limited number of bacilli, or even to isolated living bacilli which had presumably lit on a weaker spot. So, probably, it is with human infection.

We know that in sputum many of the bacilli are dead, while those which survive slowly perish in the dried sputum, even in darkness, more quickly in light. Nevertheless, the experiments of Cornet and Coates on dust in infected houses show that there is a really dangerous amount of living tubercle bacilli present in the dust, if they could only reach the lungs.

Koch's experience of spontaneous tuberculosis, and Cornet's experiment with suspended guinea-pigs, go far to show that they do reach the lungs, albeit in small quantities. On the other hand, if Flügge's view of the usual manner of conveyance of tuberculosis be correct, it is difficult to account for the entire escape of nurses and wardmaids in many sanatoria.

I now turn to Dr. Bulstrode's observations relative to the experiments on the effect of light, contributed by Dr. Ransome to the Proceedings of the Royal Society. The following statement of these experiments is given by Dr. Bulstrode in connection with the discussion of Cornet's examination of the dust in rooms occupied by consumptives.

In reference to this phase of the question, it may be pointed out that the ability of the tubercle bacillus to retain its virulence *under ordinary everyday conditions until the sputum containing it becomes so dried as to render practicable its diffusion as dust is, according to a large amount of experimental work, an improbable event.* Ransome and Delepine found, as the results of experiments conducted by them, that the time necessary to bring about the death of the bacillus when exposed to light and air was in every case less than would be necessary to reduce the sputum to dust. Dr. Ransome, moreover, points out that the test by the inoculation of guinea-pigs, which was employed in the series of investigations upon which the conclusions of himself and Delepine were based, was the most severe one that could be devised, seeing how marked is the susceptibility of these rodents to tuberculosis; and he goes on to state that human beings may be expected to prove much less susceptible to infection through the lungs than are guinea-pigs by inoculation.

Dr. Ransome infers from these experiments that finely divided tuberculous matter, such as pure cultivations of the bacillus or tuberculous matter derived from sputum, is speedily deprived of its

virulence in daylight and in free currents of air. He and his colleague maintain, too, that, since tuberculous sputum exposed to sufficient light and air suffices speedily to deprive it of virulence before it can be dried up and pulverised, danger of infection from this source need not be contemplated.

It was found, however, by these observers that, in the presence of organic matter given off by the lungs and in the absence of light and air, the bacillus could retain its power, as measured by inoculation experiments for several days.

These experiments of Ransome and Delepine, carried out several years ago, hardly seem to-day to be receiving the attention which they deserve.

I doubt if Dr. Bulstrode has been able to give much study to these experiments which will be found recorded in the Proceedings of the Royal Society, vol. 56. Knowing that the above quotation from Dr. Bulstrode's report does not quite accurately represent the views of Professor Delepine, I have carefully read the account of these experiments reprinted from the Proceedings. The results are recorded in Tables III. and IV. of the communication referred to. No stress is laid by the author on the set of experiments on Table III., and we turn therefore to Table IV.

Dr. Bulstrode will find that, so far as the experiments here recorded, and regarded as available, go, the sputum rendered sterile by exposure was, in each instance, exposed to *direct sunlight*.

As regards currents of air, the only experiments in point are recorded thus:—

Sputum kept in the draught closet for three days in a current of air (about 1,000 cubic feet per hour), in darkness, at the ordinary temperature, gave well-marked tuberculosis in thirty-two days. Sputum kept under the same conditions, *i.e.*, in a closed dark cupboard, after drying on paper, but exposed to a little air for thirty-five days, produced distinct tuberculosis in twenty-three days.

These experiments, therefore, give no guidance as to the influence of light in a living room *under everyday conditions* on the duration of viability of the tubercle bacillus. On the other hand the admirably planned and carefully executed experiments of Dr. Coates, carried out under guidance from Professor Delepine, and recorded in the transactions of the British Congress on Tuberculosis, 1901, do afford some guidance, and go to show that the bacilli perish most quickly in the presence of good lighting and ventilation.

Now there can be no question as to the powerful destructive action of direct sunlight on tubercle bacilli, and there is good reason to suppose that diffuse sunlight also exercises an

influence, decreasing with the intensity of the illumination. Nevertheless it is to be observed that in some instances Coates found viable bacilli in the dust of rooms which *at the time of his visit* were fairly well lighted. Clearly there is room here for a most valuable research, in which the effects of exposure to light of films of virulent dried sputum under identical conditions as regards air currents, but with exposure for definite periods to light of varying and measured intensity, should be ascertained. The intensity of the light might be measured by an illumination standard, and also by chemical tests, such as those employed by Professor Cohen and Dr. Bailey in their observations on the atmosphere of Manchester. Such an investigation would throw most valuable light on the requirements of living-rooms, and, apart altogether from the immediate question, would be of the greatest practical value.

To a less extent we must take the same exception to Cadéac's experiments on the effect of light. What is *natural light in a room*? Such a term may cover anything from direct sunlight to the light under which Cornet and Coates found viable bacilli in the dust of rooms.

We must also take exception to conclusions founded on Cadéac's investigations as regards the danger of "droplets" of saliva. Cadéac, apparently, worked with what was in effect an aqueous suspension of tubercle bacilli, and there was no need to prove that such a suspension produces in guinea-pigs "inhalation" tuberculosis. His work does not, so far as one can judge, lend much support to that of Flügge, who has shown that, in the act of coughing, viable tubercle bacilli are occasionally, though with difficulty, sufficiently detached from mucus to cause tuberculosis in a guinea-pig exposed in a manner which will not frequently occur in human relations.

The air passages, however, by no means constitute the only portals by which infection can be admitted into the body, and several observers have recently given it as their opinion that the bacilli find their entrance into the body chiefly through the intestines.

In Von Behring's view, as Dr. Bulstrode tells us, tuberculosis is due to the consumption of tuberculous milk.

Infection occurs, therefore, for the most part, in childhood. The bacilli, passing through the lumen of the bowel, invade the lymphatic glands, from which they assail

the lungs at some future period when the system has undergone depression.

Calmette, on the other hand, thinks that infection is chiefly of human origin, and does not occur chiefly in childhood. The infective matter, which is introduced into the system by the respiratory passages, is, he considers, swept by the cilia from the upper air passages into the pharynx, swallowed, carried into the intestines, passed through the wall of the bowel, and so enters the blood stream. The mesenteric glands of the adult, he finds, oppose in adults no effectual barrier to the course of the tubercle bacilli, which are conveyed by the lymph stream to the vena cava, enter the heart, and are so carried to the lungs, where they light up the disease.

Calmette's view is not calculated in any way to diminish the importance of viable tubercle bacilli set free from dried tuberculous sputum. The portal of entrance is different, but the process of infection is, on the whole, the same.

Dr. Bulstrode makes no attempt to guide us through the mazes of experiment and speculation which he presents. But to the administrator these are not matters of merely speculative interest. They affect the whole of his procedures.

I do not hesitate to reject Von Behring's view. It appears to me inconsistent with the results of the tuberculin test, and with the records of examination of the bodies of animals of various ages. It is still further inconsistent with the post-mortem records of healed tubercular lesions in human beings who have died of diseases other than phthisis.

Alike in human beings and in cattle, tuberculosis has been shown to be more frequent as age advances. There is nothing more striking in the record of experiments of the last Royal Commission on tuberculosis than the tendency of tubercular lesions resulting from feeding experiments to retrogress.

Calmette's experiments show the same tendency. The probabilities are that the vast majority of early abdominal tuberculosis are entirely arrested, and produce no effect on the after life.

The assumption of a slumbering tuberculosis, ready to awake at every favourable occasion seems to me purely gratuitous. It is true there are individuals who are ailing from infancy and ultimately succumb to tuberculosis of the lung. But these are the exception, not the rule; and even in these it is by no means certain that the individual would have suc-

cumbed in the absence of fresh invasion by tubercle bacilli. I do not see how such a view is to be reconciled with a history such as that given by Cornet for the Catholic nursing institutions in Prussia, the histories which we have ourselves collected over a long series of years, the invasion of fresh peoples already touched upon, the spontaneous infection of guinea-pigs with dust, the experience of persons collected in certain workshops, the history of common lodging houses, or the accumulation of phthisical persons among the home troops living in barracks. I may add that such information as I possess by no means goes to show that the tuberculosis of young children, even when it is abdominal in origin, is in a preponderating degree the result of bovine infection. It is so, no doubt, to no small extent.

If, however, we cannot accept Von Behring's view, we must still more summarily reject the view of tuberculosis latent at birth as a serious factor. It appears to me sufficient for this purpose to point to the almost complete immunity of calves from inherited tuberculosis, as determined by the tuberculin test, and to the still more conclusive fact that such calves, when reared under suitable conditions, remain free from tuberculosis, and become valuable members of non-tuberculous herds. Many such individual instances have been recorded or observed by Professor Delepine, and the experience of Bang and our own limited experience proves, on a wholesale scale, that such is the case.

If, however, tuberculosis be not inherited, at all events it may be said that the tendency to it is. This is Prof. Koch's view. But we confess to misgivings as to the acceptance of this view, except in a very limited sense. What is it that is supposed to be inherited—a diathesis, or a degree of physical feebleness, which exposes to the same disabilities in the struggle of life, induces the same temptations, educes the same follies, and facilitates the lodgment of the tubercle bacillus?

So far as I am aware, the only argument in favour of a tissue proclivity are the comparatively infrequent instances in which the members of a family have grown up and have developed tuberculosis one after another at nearly the same ages, and without apparent exposure to infection one from the other. Usually, this occurrence affects persons as they approach maturity.

But the question of sexual influences here

enters. The phenomenon is not a common one, as it would be if it were a mere question of inheritance, and we are compelled to ask whether there is not some condition affecting the reproductive organs, or the individual in association with the development of these, which in such instances facilitates infection. Moreover, there may in some families be a special tendency to the continuance of a latent tuberculosis, contracted in childhood.

Striking facts point in a different direction. In the vast majority of instances, when tuberculosis invades a family and picks off one member after another, it pays but little heed to the age of the victim, and selects rather a particular period of time within which it operates.

How are we to reconcile inherited proclivity with the theory of the virulent propagation of tuberculosis among the members of families in the case of new peoples, such as Villemain quoted in the case of New Caledonia and Van Diemen's Land, and such as Dr. Millar has painted for Pondoland, or the huge incidence of phthisis on the inhabitants of common lodging-houses.

How are we to bring under this presumed proclivity the ages which easily succumb in captivity from tuberculosis. The proclivity, then, is at the most, in all probability, a minor element. I will add that having regard to the behaviour of tuberculosis among newly-exposed peoples, one is inclined to doubt whether there has not been established in old civilisations some degree of inherited tissue resistance, the result of struggles with the bacillus.

It is otherwise with the inherited peculiarities of a larger order, though it must be admitted that they are not entirely divisible from tissue proclivities. Chief among such inheritances are a feeble heart, a sluggish brain, and a long, thin, feebly acting chest. These are, no doubt, inherited; and to this extent at least the son of a consumptive parent is exposed to increased risk of infection.

On the other hand, as Villemain pointed out, there may be countervailing protective influences; at all events, our records would not predispose one to look on such heritages as possessing an excessive amount of weight.

Dr. Bulstrode quotes Professor Karl Pearson in favour of the inherited tendency. In fact, Professor Pearson considers that infection may be put into the background in comparison with

the inherited tendency. It does not appear, however, that he has given any personal study to the disease, or to the difficulties under which facts are collected. From a knowledge of our own investigations, I should not be disposed to attach much importance to any facts ascertained by his observers as to the history of disease in the parents of consumptives of a remote date. In fact, the errors must necessarily be numerous and large. I may be wrong, but I had imagined that the methods employed by him contemplated a fair degree of precision in the data. No such precision can, in the nature of things, exist.

Dr. Bulstrode gives a brief account of Calmette's work, and we have elsewhere dealt with it. It comes in no way into collision with Cornet's conclusions, nor does it suggest any revision of existing lines of work. It does, however, suggest that increased attention should be paid by consumptive persons and those about them to the cleansing of hands and utensils. Similar precautions also will be needful in workshops, and increased attention will be required to the personnel of restaurants.

In effect, however, one hesitates to follow Calmette when he declares that the digestive organs are to be held almost entirely responsible for the introduction of infection into the system. This appears to be at variance with pathological records, and with the observations which have been made on carcasses. It presupposes also that the cilia of the bronchi are always in full action, and that the upper air passages are in general not open to invasion.

I do not think that such an assumption is approximately justifiable, either for human beings or cattle. It is, moreover, rather difficult, even with the aid of Calmette's experiments, to accept the wholesale passage of bacilli through the bowel to the lung, without any lesion of a permanent character remaining in the mesenteric glands. It is desirable that the subject should be elucidated by the collection of a series of careful complete post-mortem records, which should include early cases of phthisis in patients who have died of other causes. It may be mentioned that about the year 1891, being desirous of assessing the relative frequency of primary abdominal and thoracic tuberculosis, I suggested to Mr. James King, M.R.C.V.S., the desirability of making a series of consecutive

complete examinations of carcasses. This he did, with the following results:—

Table showing the results of examination of the carcasses of 398 cattle by Mr. James King, M.R.C.V.S.*

	No.	Number Tuberculous.	Condemned as unfit for food.	Number in which the Abdominal Organs only were affected.	Number in which both Abdominal and Thoracic Organs were affected.	Tuberculous Udders.
Cows	168	69 or 41 %	11	19	23	2
Heifers	124	27 or 22 %	3	19	4	
Bullocks	75	12 or 16 %	0	8	2	
Bulls	8	2 or 25 %	0	0	2	
Calves	23	(1 ?) or 4 %				
	398	120				

I call attention to the fact that while in young animals tuberculosis was in the main an abdominal affection, in cows some years old the purely thoracic affections predominated slightly over the purely abdominal. Nevertheless the purely abdominal affections were well in evidence. I do not quote other figures, as one doubts whether observations not made purely with this object in view can be relied upon.

The features of spontaneous tuberculosis in guinea-pigs, as described by Koch, may also be recalled, as well as the prevailing opinion among pathologists, which cannot be lightly put aside. Dr. Bulstrode deals with the experiments and conclusions of the recent Royal Commission on tuberculosis, which show, as he says, that it is not improbable that a material amount of human tuberculosis is attributable to the introduction into the intestinal tract of tubercle of bovine origin. Elsewhere he quotes, apparently with approval, an expression of opinion by Dr. Hamer that tuberculosis may have to be reinforced by passage through an animal body. But except in a remote sense, the experiments of the Royal Commission lend no support to this view. Tubercle bacilli, whether of bovine or human origin, when fed to calves, produced abdominal lesions, nearly all of a retrogressive character.

To be continued.

* Report of the Royal Commission on Tuberculosis, 1898, Part II., page 164.

CALMETTE'S TUBERCULIN OPHTHALMIC REACTION AS A HELP IN THE EARLY DIAGNOSIS OF TUBERCULOSIS.

By H. C. LECKY, M.A., M.B., B.Ch., D.P.H., Acting Medical Officer of Health, Brighton.

IN the summer of 1907, Calmette showed that inflammation was produced in the eye of a tuberculous patient following the application to it of a small quantity of a dilute solution of tuberculin, a similar reaction being absent from the eye of a healthy person. It was at once clear that, if these observations should be confirmed by further work, an exceedingly simple and most needed help in the diagnosis of early tuberculosis was at hand. Numerous experiments have been conducted testing this reaction, and the following tables summarise some of the already published results.

The Nature of the Reaction.—The eye into which the drops are to be instilled must be healthy and free from any abrasion. A 1 per cent. solution in sterile distilled water of a dried precipitate, prepared by the addition of 95 per cent. alcohol to tuberculin, is employed. One drop of this is placed in one eye. If the patient is tuberculous a reaction takes place.

The exact time at which this begins varies from about two hours to (in a very few cases) twenty hours. The duration of the reaction also varies greatly from about two to ten days, the maximum reaction, however, being reached in from eight to sixteen hours. Although the inflammation is usually mild and sometimes exceedingly hard even to detect, in a few cases it is so severe that there is a purulent discharge from the eye. Fortunately, however, no case has yet been recorded in which the eye has been permanently damaged. Two other points are worthy of mention. The various reports show that the degree of reaction bears no relation to either (1) the degree of activity of the tuberculous lesion or (2) the extent of the lesion. Persons with healed tuberculous lesions fail to give the reaction. The test, therefore, will be an additional help in determining when a tuberculous lesion is cured.

TABLES SHOWING THE RESULTS OF USING THE TUBERCULIN OPHTHALMIC REACTION AS A HELP IN THE EARLY DIAGNOSIS OF TUBERCULOSIS.

A.—CASES KNOWN TO BE TUBERCULOUS.

Authority.	Reference.	Character of Cases.	No.	Posi- tive.	Double. -ve.	Nega- tive.	Remarks.
Sydney Stephenson, M.B., C.M.	<i>British Medical Journal</i> , 19-10-07	Known to be tuberculous.	5	5	—	—	
W. McLennan	<i>British Medical Journal</i> , 7-12-07.	" "	25	23	—	2	Reaction began in from 2½ to 10 hours. Occasionally delayed to second day. Reaction usually at its height in 10 hours. Severe reaction in 25 per cent. Conjunctivitis sometimes lasted for a week or 10 days.
		" "	20	19	—	1	This one negative case proved later to be tuberculosis by inoculation experiments.
		" "	14	12	—	2	
Letulle	Quoted in W. McLennan's paper— <i>loc. cit.</i>	" "	75	72	—	3	Longest period between application of tuberculin to eye and onset of reaction was 20 hours. In severe cases maximum reaction in 16 hours, and lasted more than a week. It is difficult to draw conclusions between the intensity of the reaction, and (1) the amount of lung involved, and (2) the activity of the lesion.
J. S. Webster and J. A. Kilpatrick	<i>British Medical Journal</i> , 7-12-07.	Phthisis - tubercle bacilli found in sputum	43	43	—	—	Maximum reaction, 8 to 12 hours; duration, 2 to 7 days. Sometimes slight rise of temperature, 1° C.
H. Audeoud	<i>B.M.J.</i> , 7-12-07 (<i>Rev. Med. de la Suisse Rom.</i> , 20-10-07.)	Definite tuberculosis in children aged 8 months to 15 years	13	12	—	1	
Collected by Audeoud.	<i>loc. cit.</i>	Known to be tuberculous	261	247	—	14	
Stanley Green	<i>Lancet</i> , 19-12-07	Lupus	4	3	—	1	Records also 3 negative reactions in 3 cases of pulmonary tuberculosis in the sputum of which tubercle bacilli had been found.
		Cured lupus	1	—	—	1	
Austin and Grünbaum.	Proceedings of the Royal Society of Medicine, Vol. I., No. 2, p. 74	Known to be tuberculous	19	18	—	1	
L. Meille	<i>B.M.J.</i> , 11-1-08, quoted from <i>Rassegna di Terapia</i> , Turin	" "	11	9	—	2	Meille does not consider a slight redness lasting for 1½ to 3 hours after the instillation without fibrinous secretion or lacrymation to be a positive reaction.
		Total	491	463	—	28	
		Per cent.	100	94.3	—	5.7	

B.—CASES POSSIBLY TUBERCULOUS.

Authority.	Reference.	Character of cases.	No.	Posi- tion.	Double. -ve.	Nega- tive.	Remarks.
Sydney Stephenson.	<i>loc. cit.</i>	Not known to be tuberculous	18	12	—	6	Eyes cases.
Stanley Green	"	Swelling in neck	1	1	—	—	Tubercle bacilli found afterwards in the pus.
"	"	Ulcer on chin of child	1	—	—	1	
"	"	Glands in children	2	—	—	2	Proved subsequently to be non-tuberculous. In majority of 50 cases onset of reaction was delayed to 16th or 20th hour.
Austin and Grünbaum	"	Pleurisy	6	3	—	3	
		Total	28	16	—	12	
		Per cent.	100	(figures too small for percentage.)			

C.—CASES PROBABLY TUBERCULOUS.

W. McLennan	<i>loc. cit.</i>	Suspected tuberculosis	12	9	—	3	One of these 3 negative cases was a quiescent tuberculous hip.
J. S. Webster and J. A. Kilpatrick	"	Comparatively definite signs of pulmonary tuberculosis	58	36	4	18	One of these 18 negative cases had shewn tubercle bacilli in the sputum one month before, but subsequent examinations had failed to show any.
		Suspected cases with suggestive histories	16	6	3	7	
H. Audeoud	"	Suspected tuberculosis	3	1	—	2	
		"	47	38	—	9	
Collected by Audeoud	"	Total	136	90	7	39	
		Per cent.	100	66.2	5.1	28.7	

D.—CASES CONSIDERED TO BE HEALTHY OR NON-TUBERCULOUS.

W. McLennan	<i>loc. cit.</i>	Apparently free from tuberculosis	20	4	—	16	
		"	11	—	—	11	
Mantoux	Quoted by W. McLennan— <i>loc. cit.</i>	Apparently healthy children	200	16	—	184	
Webster and Kilpatrick	<i>loc. cit.</i>	Considered healthy	4	—	2	2	One of each of these two groups subsequently gave the reaction.
H. Audeoud	"	Non-tuberculous	15	—	—	15	
Collected by Audeoud	"	No clinical symptoms of tuberculosis	303	25	—	278	
Austin and Grünbaum	"	Diseases other than tuberculosis	50	—	—	50	
L. Meille	"	Free from any tuberculous infection	7	—	—	7	
		Total	610	45	2	563	
		Per cent.	100	7.4	0.3	92.3	

NOTES ON SOME OF THE RESULTS OF THE RE-HOUSING OPERATIONS IN LIVERPOOL.*

By E. W. HOPE, M.D., D.Sc., Medical Officer of Health for Liverpool.

NOTWITHSTANDING the removal of large numbers of insanitary courts and alleys by either the Corporation or by the necessities of increasing commercial enterprise and need for more warehousing, railway or dock accommodation, Liverpool still had a larger proportion of insanitary dwellings built back to back and arranged in narrow courts and alleys than any other town.

The important agencies of commercial enterprise have, since 1864, largely helped in the removal of insanitary property. The needs of railway and warehouse companies, and many other businesses, have led to the removal of from 40 to 50 per cent. of those insanitary dwellings which have disappeared, the balance having been dealt with by the Corporation.

In November of 1883, a special committee, called the Insanitary Property Committee, under the presidency of the late Sir A. B. Forwood, was appointed to deal with this subject, which hitherto had formed part of the duties of the Health Committee.

It appears that at that time something like 2,300 insanitary courts remained, which contained approximately some 15,000 houses.

A forecast made by Sir Arthur Forwood at the time, as to the cost of dealing with the whole of that property, including the cost of land and buildings, was £750,000; and that to provide accommodation for some two-thirds of those dispossessed, whom it would be necessary to provide for, would be another £660,000, making a total of £1,410,000.

The return in rentals, he estimated, would leave a loss to the Corporation of not more than a fraction over 1d. in the £ on the rates, a loss which, he pointed out, would be more apparent than real, for the gain to the town in health would mean reduced poverty, diminished drunkenness, and better labour.

In 1900 the name of the Insanitary Property Committee was changed to that of Housing Committee, with a view to give greater emphasis to the need to rebuild as well as to pull down, since private enterprise was unable to provide the necessary dwellings in the suitable parts of the city, and the demands upon the ratepayers were increasing.

* Paper read before a meeting of the Incorporated Society of Medical Officers of Health, 13th March, 1908.

Up to 1900 almost all of the insanitary property dealt with by the Corporation had been dealt with under a local Act which had enabled the Corporation to demolish insanitary houses, but left it optional with the owner whether he would sell or retain the site. In view of the fact that the insanitary houses were aggregated together in large blocks, the local Act enabled the Corporation to clear entire areas which, on the purchase of the ground, have formed good sites upon which workmen's dwellings have been erected. The excellent areas known as the Adlington Street and Dryden Street areas were acquired in this way, but latterly, owing to the great aggregations having been dealt with, and remaining insanitary areas being interspersed with property which was not insanitary, the usual procedure under the Housing of the Working Classes Act, has been followed, and operations under the local Act have been very much restricted.

It is under the Housing of the Working Classes Act that the great schemes in the areas known respectively as Hornby Street, Northumberland Street, Mann Street, and others, have been carried out; furthermore, the five large schemes at present in progress are all of them proceeding under the Housing of the Working Classes Act. Altogether, ten schemes under the Housing of the Working Classes Act have been wholly carried through, or are now in progress. The Adlington Street, and Dryden Street areas, already alluded to, came into existence through the Liverpool Sanitary Amendment Act of 1864, whilst the Victoria Square dwellings were built under the Artizans' and Labourers' Dwellings Act of 1875. Since 1901, all the re-housing has been accomplished under the Housing of the Working Classes Act.

With regard to the isolated blocks of insanitary houses dealt with, which through their situation could not be included in the scheme, Closing Orders have been the lever of demolition, either of the whole, or part, according to the possibility or otherwise of improving part of the property. It has been found convenient to have recourse also to the Local Act, as the Local Act enables a certain compensation to be paid, and in proceeding with Closing Orders this small compensation has oiled the machinery of progress very considerably, and removed a considerable amount of hostility and opposition which must have resulted in difficulty and delay.

The question of licensing, and of the sale of drink, bears very definitely upon our subject.

In order to acquire areas for rebuilding under the Housing of the Working Classes Act, the properties existing must be purchased and paid for. The first point to obtrude itself in these poverty-stricken, squalid, and insanitary districts is the large number of licensed premises upon them.

The value of the licensed premises, say three or four in an area, is so great as to very materially swell the entire cost of a scheme to the ratepayer. As a consequence of this, the Housing Committee, reluctant to impose these burdens upon the ratepayer, have left the licensed premises, usually corner ones, untouched, to their subsequent great regret; and not only so, but they have even stayed their hands, and refrained from dealing with an insanitary area for a time on account of the immense cost from this circumstance.

It is of course open to discussion how far a sanitary authority is justified in spending money borrowed for purposes under the Housing of the Working Classes Act in buying-out licenses.

But there is yet another financial aspect of the question, viz., the amount wasted by the people in drink, which, if properly spent, would do more towards alleviating the misery and wretchedness with which we are confronted in these districts than anything which charity in all its forms, or even the Corporation of Liverpool, can do.

For example, in the miserable and squalid Hornby Street area there were five public houses, and it was proved that in three of them upwards of £5,000 per annum was spent in drink, notwithstanding that there were 48 more licensed premises, each doing no doubt as large a trade, within 200 yards of the area.

I am putting these facts to shew that the money will be well spent in extinguishing these licensed premises—that less waste in drink will leave a better margin for rents, and a less scanty supply of clothes and food for the children.

To return to the dwellings. At the present time the Corporation have in their possession 2,167 dwellings, comprising 5,272 rooms, in addition to scullery, separate w.c., etc. The rental of the houses varies from 1s. 9d. to 5s. 6d. per week, in accordance with the amount of accommodation and the situation of the house.

With regard to the financial position of these dwellings, the report for last year shews a receipt for rents of £18,325, and an outlay for upkeep, painting, repairs, wages of attendants, etc., of £8,650, shewing a net profit for the year of receipts over outlay of about £9,675. This amount goes towards diminishing the debt, paying interest, and sinking fund upon the building. It leaves a deficit of about £27,873 a year to make up, and this amount practically represents 2d. in the £ upon the rates.

Since the passing of the 1864 Act

there has been expended, including liabilities actually incurred in pending cases approved by the Council for the demolition of insanitary property, and after allowing for sums realised by the sales of surplus land to the 31st

December, 1907, the sum of £353,657

For the erection of dwellings and the acquisition of sites under the Housing of the Working

Classes Acts, the sum of ... £524,299

Making a total of ... £877,956

of which no less than a sum of £535,211 has been expended since 1894.

To this must be added the five areas approved of by the City Council on the 6th February last year. Schemes passed the meeting of the Council on that day which deal under the Housing of the Working Classes Act with five more insanitary areas, comprising some 800 slum dwellings, and provide for the entire suitable rebuilding of these areas. The estimated cost is about £275,000, interest and sinking fund repayable with the sanction of the L.G.B. in eighty years as regards land, sixty years as regards buildings.

There is now an exceedingly important matter to be referred to concerning the tenements. These Corporation dwellings are not let to every applicant. They are reserved exclusively, and very wisely, for those who have been dispossessed by the action of the Corporation, either by the demolition of their houses, by proceedings taken against them on account of breaches of the laws relating to over-crowding in an otherwise sanitary dwelling, or by the closure of an illegal cellar dwelling.

This policy results in some temporary financial loss. At the present time something like eighty houses are empty, awaiting tenants. These houses are held in reserve against the next move in the direction of demolition, which is now pending. Mr. Taylor, the manager, informs me that he would derive approximately £1,500 a year more income from these dwellings if he were allowed to let them to anyone, presumably at their full market value, instead of at the more modest rentals now asked.

The following statistics relating to the applications for Corporation tenements during 1907 tell their own story, and give the results of investigations made into the circumstances of each applicant for a house:—

Number of applications received and investigated	489
Reasons given for making application:—	
House stated to be overcrowded	417
" " " insanitary...	27
Cellar " " overcrowded	15
" " " insanitary...	25
" " " illegal	2
• About to be dispossessed	3
Total	489
Number of applicants who gave false addresses	78
Number of applications where alleged overcrowding was found on investigation not to exist	248
Number of cases of one family overcrowding house of whom 11 accepted dwellings	19
Number of cases of overcrowding cellars of whom 7 accepted dwellings	17
Number of cases of illegal occupation of cellar of whom 4 accepted dwellings	9
SUB-LET HOUSES.	
Number of sub-let houses stated to be overcrowded	118
Number found overcrowded on night visit	66
Number where alleged overcrowding was found abated on night visit	52

Number of convictions for overcrowding ... 64

Number of applicants from overcrowded sub-let houses who accepted dwellings ... 29

The total number of cases of overcrowding in ordinary dwellings, sub-let houses, and cellars, and in the case of illegal occupation of cellars, was 111, in 51 of which the applicants were allowed to rent a Corporation dwelling.

In a considerable number of cases the overcrowding was of recent date, and the offence had evidently been committed with the intention of qualifying for a Corporation house. For instance, in 14 cases the length of tenancy ranged from 1 day to 3 weeks.

In some cases the applicants were found to be drunk at the time of the inquiry. Thirteen cases of drunkenness came under the notice of the inspectors.

The total number of day visits paid with the object of ascertaining the genuineness of the application, during the year, was 575, and 124 night visits were paid, the total number for the year being 699.

The important point of the rates of sickness and mortality in the new dwellings must be referred to. The returns are most favourable in those dwellings which are most airy situated and most open. They are less favourable, and even disappointing, in dwellings built in the more congested area. This, however, must partly be accounted for by the fact that the occupants and their progenitors have for several generations lived under insanitary surroundings. Their habits and customs are not good, and mend but slowly. Moreover, they are among the most prolific sections of the population, and the rapid increase in families creates difficulties in regard to overcrowding, a circumstance which emphasises the fact that it is impossible to keep them all in the districts where many desire that they should remain; there must be an overflow.

The actual rates of mortality in the old insanitary dwellings averaged about 50 per 1000 per annum. In some blocks they were considerably higher during the few years preceding their demolition, whilst in others these rates were about 45 per 1000.

The accompanying tables indicate the statistics for the last two years of all the Corporation dwellings which have been occupied during that period.

CORPORATION DWELLINGS—1906.

Dwellings.	Population census, July, 1907.	No. of births 1906.	Birth rate per 1000.	No. of deaths 1906.	Death rate per 1000.	No. of deaths below 1 year.	Infant death rate per 1000 births.
St. Martin's Cottages	428	19	44	11	25.7	3	157
Victoria Sq. and Juvenal Bldgs.	1190	84	70	34	28.5	15	178
Gildarts Gardens Group	868	41	47	29	33.4	13	317
Dryden and Rachel Streets, etc.	647	31	47	31	47.9	11	354
Kempston Street Group	291	19	65	10	34.3	1	52
Newsham and Kew Streets	455	16	35	17	37.3	2	125
Adlington Street Group	827	32	38	43	51.9	11	343
Stanhope Cottages	243	8	32	7	28.8	1	125
Hornby Street Group	599	39	65	17	28.3	9	230
Clive and Shelley Streets	300	8	26	14	46.6	5	625
Other small dwellings	546	29	53	8	—	4	138
Total Population	6394	326	51	221	34.5	75	230

CORPORATION DWELLINGS—YEARS 1906 AND 1907.

Dwellings.	Population census, July, 1907.	No. of births, 1906 & 1907.	Average birth rate per 1,000.	No. of deaths, 1906 & 1907.	Average death rate per 1,000.	No. of deaths below 1 year, 1906 & 1907.	Average infant death rate per 1,000 births.
St. Martin's Cottages	428	55	64	13	15.2	3	78
Victoria Sq. and Juvenal Gdns.	1190	151	63	66	27.6	29	193
Gildarts Gardens Group	868	105	60.	68	38.5	26	260
Dryden and Rachel Streets, etc.	647	96	73	55	37.5	21	253
Kempston Street Group	291	37	63	27	46.2	3	81
Newsham and Kew Streets	455	44	48	30	32.9	9	187
Adlington Street Group	{ 827 (1906) 1016 (1907) }	85	45	74	41.2	21	265
Stanhope Cottages	243	16	32	8	—	1	63
Hornby Street Group	{ 599 (1906) 1374 (1907) }	133	66	63	30.8	22	184
Clive and Shelley Streets	300	27	45	24	39.9	8	391
Upper Mann Street	297 (1907)	18 (1 year)	60 (1 year)	7 (1 year)	23.5 (1 year)	1	55 (1 year)
Other small dwellings	{ 546 (1906) 359 (1907) }	48	52	18	21.2	10	226
Total Population	{ 6394 (1906) 7468 (1907) }	815	58	453	32.7	154	195

CORPORATION DWELLINGS—1907.

Dwellings.	Population census, July, 1907.	No. of births, 1907.	Birth rate per 1,000.	No. of deaths, 1907.	Death rate per 1,000.	No. of deaths below 1 year.	Infant death rate per 1,000 births.
St. Martin's Cottages	428	36	84	2	—	—	—
Victoria Sq. and Juvenal Bldgs. ...	1190	67	56	32	26·8	14	209
Gildarts Gardens Group	868	64	73	39	43·7	13	203
Dryden and Rachel Streets, etc. ...	647	65	100	24	37·0	10	153
Kempston Street Group	291	18	61	17	58·1	2	111
Newsham and Kew Streets	455	28	61	13	28·5	7	250
Adlington Street Group	1016	53	52	31	30·5	10	188
Stanhope Cottages	243	8	32	1	—	—	—
Hornby Street Group	1374	94	68	46	33·4	13	138
Clive and Shelley Streets	300	19	63	10	33·3	3	158
Upper Mann Street	297	18	60	7	23·5	1	55
Other small dwellings—Arley, Mill, Toxteth and Eldon Streets	359	19	52	10	27·8	6	315
Total Population	7468	489	65	232	31·0	79	161

It is quite true that the populations are not large, nor is the period of two years a long one, yet the returns tell an important story. Clearly there is still something wanting, and that something is an improvement in the personal factor, an improvement in the habits, and in the care and attention bestowed upon infants and young children.

A close inquiry reveals the existence of many families living under very adverse conditions, but, owing to the intelligence and sobriety of the parents (and the two always go together), the whole of the large family has been successfully reared.

There is on the other hand the opposite extreme, where lack of intelligence, thriftlessness, dirty habits, and frequent drinking bouts have resulted in neglect of the household and the loss of life of the infants, but the improved environment has unquestionably led to general improvement, and continued, kindly, and tactful supervision will effect a great deal more.

DISCUSSION.

Dr. W. H. SYMONS asked if Dr. Hope had been able to overcome the difficulty in regard to storing of food. The difficulty they had had to contend with in Bath was to provide a food store free from the emanations of the room.

Dr. G. F. MCCLEARY commented upon the admirable photographs submitted by Dr. Hope in connection with his paper. He was of opinion that bad sanitary conditions should be photographed and put on record, so that future historians should be able to see what had been achieved in the past.

Dr. P. CALDWELL SMITH said that in London as a whole they desired to know definitely whether the mortality in the large dwellings was greater than in the cottage dwellings. In his district, the London County Council had only erected the cottage type of dwelling, with large open spaces. It would be most interesting to have some statistics in regard to the birth and death rates in these different classes of property.

Dr. WM. BUTLER said they had before them a public health experiment on a gigantic scale, at a tremendous cost, with most satisfactory results. They had an example of a population housed in insanitary conditions, and the same population housed in sanitary conditions. A death rate of 45 to 50 per thousand reduced to 30 per thousand was ample justification for the steps that had been taken. With a death rate of 30 per thousand in the model dwellings of Liverpool, there was still a large margin for improvement, and, in his opinion, that was to be brought about by dealing with the habits of the people themselves. Referring to the rentals charged by the Liverpool Corporation, they appeared to him to be very low.

Dr. H. BEALE COLLINS asked whether the Society possessed a copy of Dr. Hope's book, prepared for

one of the recent congresses, and if not, ventured to suggest that Dr. Hope should present a copy for the library of the Society.

Dr. F. E. FREMANTLE trusted that Dr. Hope would eventually be able to give the statistics for a period of years. He was also of opinion that a further improvement in the death rate was to be looked for by helping to improve the habits of the people by education. This should be done during the school-time of the individual.

Dr. J. D. MCCRINDLE said that a considerable amount of good work had been done in Birmingham at a very modest cost to the Corporation, but with regard to rentals, the Corporation had no real control over the landlords. Where landlords had been compelled to put dwellings into sanitary repair, it had resulted in raising rents to a certain extent.

Dr. HERBERT JONES considered that the Society was indebted to Dr. Hope for pointing out to the sanitary authorities of this country that it was quite possible to work the provisions of the Housing of the Working Classes Act. They had the greatest difficulty to persuade owners in rural districts that insanitary cottages were unfit for habitation. He was usually met with the remark that such cottages had done for generations, and were quite good enough now. Referring to the very high birth rates mentioned by Dr. Hope, he thought that on examination they were not really so high as they actually appeared. It seemed to him that it was very unlikely there would be many old people in the dwellings. No doubt most of the old people would go the workhouse. If Dr. Hope were to work out his birth rate in the same way as the Registrar-General had been doing of late, he would find that it was not so high as it appeared.

Dr. CROOKSHANK asked if the rate was corrected, and if Dr. Hope could give any information in regard to the prevalence of infectious disease in these dwellings.

Dr. H. MEREDITH RICHARDS (chairman) considered that the Society should congratulate the Liverpool Corporation on the courage and success with which the experiment had been carried out. As to the birth rate, it was essential that it should be corrected, not only in regard to institutions, but also in regard to age and sex. It was also a question whether the old people should always be referred to the slum district from which they came. As to the Liverpool slums, he was personally indebted to them for the only outbreak of typhus fever he had seen. He moved that a hearty vote of thanks be accorded to Dr. Hope for his excellent paper. This was carried by acclamation.

Dr. HOPE, in reply to the point raised by Dr. Symons, said that the food stores which had been provided had not always been as satisfactory as they wished, but as they went on, so they improved in the details of these dwellings. With reference to the remarks made in regard to the vital statistics, it was a very difficult thing to gauge the exact position in these dwellings. His personal impression was that the birth rate was really high. He quite agreed with Dr. McCleary as to the importance of photography in their work. Unless they could chronicle in some way what the

condition of things was before improvement was made, they had nothing to gauge the improvement by. With regard to the personal factor, he looked upon it as a most important point, and was endeavouring to make an investigation into that side of the question. As to the deaths, almost all those in the poorest parts of Liverpool take place in public institutions. He had made a comparison with Leeds and Manchester, and the same story of poverty was revealed there. In Liverpool they followed the usual practice of returning the deaths from the districts whence they came. There is not a large amount of infectious disease in Liverpool; it had, in fact, very much diminished, owing to the excellent hospital equipment provided for the city. He should be pleased to provide the library with a copy of the volume referred to by Dr. Beale Collins, and thanked the meeting for the kind manner in which they had received his paper.

SIR HENRY LITTLEJOHN'S RESIGNATION.

ALL who are engaged in public health work will regret to learn that Sir Henry Littlejohn has resigned his post as Medical Officer of Health of Edinburgh, a post he has held for the last forty-six years. Sir Henry took his doctor's degree as long ago as 1847, and his period of office has extended considerably beyond the fatal sixty-fifth year that marks the conclusion of most official careers. It would be superfluous to dilate upon the great services Sir Henry has rendered, both as administrator and teacher, to the cause of public health progress during his long period of office. There are few reforms that have not owed much to his efforts. As a public health teacher Sir Henry held a unique position. His pupils have gone forth into all lands, and many a distinguished health officer has learnt his first lessons in public health from those racy Edinburgh lectures, as full of wit and humour as of shrewd common sense and sound epidemiological teaching. Although Sir Henry's official life is over we trust he will still continue to attend the annual Congresses of public health workers, and that his wise advice and cheery encouragement will long be heard by those who are still actively grappling with the problems of the prevention of disease.

A TUBERCULOUS COW.—The first prosecution at Leeds under the Milk Provisions of the Leeds Corporation (General Powers) Act, 1901, came before the Leeds Police Court on March 10, 1908, when Walter Bailey, a farmer of Kirkstall, was fined £1 and costs for neglecting to give written notice to the Medical Officer of Health that he had in his dairy a cow affected with tuberculosis of the udder.

ISOLATION HOSPITAL EXPENSES.*

By DR. SIDNEY BARWISE.

Medical Officer of Health to the Derbyshire County Council.

SOME twelve months ago I was instructed to make a report upon the administration of the isolation hospitals within the County of Derby. Considerable dissatisfaction was felt at the cost of these institutions, both as regards capital expenditure and cost of maintenance. As a result of my investigations I came to the conclusion that a uniform system of accounts was extremely necessary for isolation hospitals, as otherwise it was impossible to ascertain what institutions were economically managed, and if there was in any hospital extravagant waste. As is well known, the secretaries of most of the large general hospitals, both metropolitan and provincial, have adopted a uniform system of accounts which was drawn up by Sir Henry Burdett. This system was much too elaborate for small isolation hospitals, and after investigating various methods of keeping isolation hospital accounts, I was finally driven to draw up one of my own.

The greatest cause of difficulty in hospital accounts is the separation of the cost of maintenance of the staff from that of the patients. In most of the large hospitals separate accounts are kept of the food consumed by the resident staff from that consumed by the patients, but in small hospitals this is quite impracticable, and the system of accounts which I suggest is suitable for isolation hospitals, is only for those of say less than 100 beds.

Perhaps some exception may be taken by the medical superintendents of the hospitals which have been provided under the Public Health Act, to the classification of expenses which I have adopted. But the hospitals in Derbyshire have all been erected under the Isolation Hospitals Act, and I was compelled to adopt the classification of expenses as given in Section 17 of that Act. If the Society of Medical Officers of Health approves of my suggestions, I think it would be worth while to ask the Local Government Board to approve the schedules and to ask that the abstracts of accounts of the various isolation hospitals in the country be published in the same form.

By Section 17 of the Isolation Hospitals Act, the expenses of a joint hospital committee are classified under three heads:—

1. *Structural expenses*, including cost of site, building, furnishing, permanent extensions, and structural repairs.
2. *Establishment expenses*, which include salaries, painting, cleaning, renewals, and ordinary repairs.
3. *Patients' expenses*, which include the food of the patients, the cost of disinfecting and medicines.

The patients' expenses are a debt due to the hospital committee from the district councils sending the patients in. The other expenses are paid out of common fund to which the constituent authorities contribute in accordance with the terms of the order forming the joint hospital committee.

This classification is, to my mind, perfectly satisfactory, but unfortunately sub-section 3 of Section 17 of the Act states:—"In the case of any doubt arising as to what are structural expenses, establishment expenses or patients' expenses, within the meaning of the Act, the decision of the hospital committee shall be conclusive." This sub-section is simply a monstrous power to put in the hands of any committee consisting of representatives of different district councils, and one which might be abused to the detriment of constituent authorities having a minority of votes. The sub-section should be repealed, and in case of doubt the Local Government Board should be the arbiter as to how the expenses should be classified. A case which came to my knowledge was one of a hospital committee deciding that the patients' expenses were £1 per week, thus amassing a considerable profit which was carried to the common fund. It is obvious that in a case like this the district in which an epidemic was existing was being severely penalized. It not only pays its proper patients' expenses, but something in addition to the common fund at a time when it can least afford it.

The reduction in the cost of administering the hospitals in London which receive grants from the King Edward's Hospital Fund, is evidence of the advantage of adopting a uniform system of accounts. The report of this fund for 1906 states that there has been a saving of £21,000 in one year in the accounts of sixteen hospitals.

The reason why accounts are not comparable is that there are many articles in regard to which it is quite open to question whether they should be put down as structural expenses or establishment expenses. This question is arising in acute

form in various parts of the country with regard to what is fair wear and tear in elementary schools. In Derbyshire this point was settled by a very practical committee, and I have taken from the education committee a definition of what are structural repairs, and what repairs should be put down to establishment expenses; but unless it can be uniformly agreed as to what are structural repairs and what merely maintenance repairs, it is quite obvious that it is impossible to compare the cost of the different hospitals.

The whole scheme, then, depends upon having a detailed schedule, specifying under what main headings and what sub-headings different articles and different expenses are to be classified. A committee of hospital secretaries has already drawn up a schedule for large hospitals, and I have gone through this schedule and condensed it into one suitable for isolation hospitals.

The three main headings I have taken are the three main headings given in Section 17 of the Isolation Hospital Act. I have further divided the establishment expenses into fourteen sub-headings, six of which are for provisions, five more for articles, which will be ordered from the hospital, such as appliances, linen, hardware, coal, wood, gas and ordinary repairs, and the remaining three are wages, rates, office expenses and stationery, the orders for which would come from the Central Office. In the small hospitals it might be sufficient to condense the six headings for provisions into two—provisions and stimulants. This would still enable a comparison to be made between the small hospitals and the larger hospitals adopting the full schedule. The articles ordered from the hospital are classified in the extended form under eleven headings, while in the condensed form they will be grouped under seven headings. Unless the schedule states pretty fully under which heading the various items are to be classified, the whole thing will be chaos. For instance, there is no reason why new fire-bars to a heating apparatus should be classified as establishment expenses, and renewals to the other parts of the heating apparatus should appear under structural expenses; except that the fire-bars are parts which constantly require renewing, and form an item which will have to appear each year. The same thing applies to repairs to water-taps and repairs to pipes. The repairs to the pipes are classified as structural expenses, while the repairs to the taps are

establishment expenses. Taking the classification in detail, the following items are put down as structural expenses:—

Cost of site, cost of hospital, furnishing, permanent extension, drainage works and structural repairs, including repairs to walls, roofs, spoutings, boundary walls or fences, drainage repairs and renewals, levelling and asphaltting of paths. Heavy repairs to heating apparatus, floors, staircases, plastering of walls and ceilings. Renewals of gas and water-pipes and apparatus.

Coming now to the ordinary repairs, these include cleaning, keeping the grounds in order, planting, painting, lime-washing and, as I have said, renewals to water-taps and such things as fire-bars.

The necessity for adopting a schedule will be seen when I say that in making my notes of the establishment expenses of the hospitals of Derbyshire, I found in one case, water classified as provisions; in another case I found port wine and petroleum on the same invoice as establishment expenses. I take it that port wine should have been classified as patients' expenses.

Now comes the question as to how the cost of provisions should be allocated between the patients and the staff. At one of the hospitals in the county, the committee boarded the staff at 10s. per head per week. This is certainly not an economical arrangement, and there would be a great temptation to the members of the staff to help themselves to the provisions provided for the patients. Another hospital committee worked on the assumption that each member of the resident staff cost 10s. per head per week, and deducted this amount from the total cost of provisions and charged the balance to the patients' expenses account. Another hospital committee assumed that the food for each resident member of the staff cost 5s. per week, and charged the balance of the cost of provisions to the patients' expenses; while yet a fourth committee worked in the reverse direction, charging 8s. 5d. per week for the food of each adult patient, and 5s. 5d. per week for each child, and transferring the balance to the establishment expenses for the maintenance of the staff. In this case the balance worked out at 4s. 7d. per head of staff per week, an amount which is obviously too low.

I think it must be seen that unless the same plan is adopted in each hospital, not only is it impossible to compare the management of the different hospitals, but there is also a great temptation to cook the accounts;

* Paper read before a meeting of the Incorporated Society of Medical Officers of Health, on 10th January, 1908.

and when we remember that these small hospitals are managed by lay committees, and that the medical superintendent is generally a doctor in private practice, who cannot be expected to have that grip of things which those of us who are whole time medical officers of health, regard as essential, the necessity for the system I am advocating is apparent.

After going into the matter carefully, I have decided that for small hospitals a reasonable method of splitting up the cost of provisions between the staff and the patient is to charge 7s. 6d. per head per week for each member of the resident staff, and transfer the balance of the cost of provisions to the patients' expenses account; and in the books which we have provided for the purpose for the hospitals of Derbyshire, the whole of the cost of provisions is in first instance booked to establishment expenses, and at the end of each month the cost of provisions over 7s. 6d. per head of the resident staff per week is transferred to the patients' expenses account.

The method of working this system of accounts is first of all for all orders to be given on a triplicate form. The counterfoil is kept, and the order and invoice are given to the tradesman, who returns the invoice with goods. The articles on the invoice are then classified by the housekeeper or the medical superintendent according to the eleven headings or the seven headings on the condensed form, whichever is approved. At the left-hand bottom corner of the invoice there is an analysis form shewing the headings under which the articles supplied are to be classified. The invoices are sent to the clerk during the month, and all he has to do is to enter the amounts up under the headings shewn in the analysis form at the bottom of the invoice.

Incidentally I may mention that, speaking generally, the total structural, establishment and patients' expenses of the hospitals of Derbyshire have involved a rate of from 1½d. to 2½d. in the pound in the different districts during the period that the loans are being paid off, this sum being made up of a little over a halfpenny rate for structural expenses, a third of a penny for patients' expenses, and 1½d. for the establishment expenses.

From these figures it will be seen that if any considerable economy is to be effected, it must be in the establishment expenses, and with the object of inducing the various hospital committees in the County of Derby to adopt the uniform system of account-keeping, so that accurate comparisons can be interchanged between the various hospital committees, the Derbyshire County Council have decided to give a grant on certain conditions, not exceeding £10 per bed space

(occupied) per annum to those hospital committees who will keep their accounts in books provided by us, and provide us with an annual abstract of accounts on a form prescribed.

I admit that, with the way in which the accounts are kept at present, it is impossible to make accurate comparisons, but after making all the necessary corrections that I could, I found that the establishment expenses per occupied bed space per annum in the Derbyshire hospitals varied from £47 to £107, that the salaries, rations, and uniforms, per occupied bed space varied from £29 to £76. The total salaries, rations, and uniforms for hospitals of practically the same size, varied from £309 per annum to £890. The cost of provisions per head per week, including staff and patients, varied from 4s. 4d. to 5s. 7d., or, expressing it as pounds, per annum, from £11 4s. to £14 9s.

In conclusion, I may say that the system of accounts I suggest has been adopted, with the approval of the Local Government Board, by three of the joint hospital committees of Derbyshire, and I have no doubt other hospital committees will follow suit, in order to obtain the county grant. I have also had an opportunity of laying the schedules and forms before the chief inspector of audits of the Local Government Board, and have adopted several suggestions he was good enough to make with regard to the schedule classifying the expenses. I have also forwarded a copy to Sir Henry Burdett, who has been good enough to say that, in his opinion, I have done a public service in making the suggestions that I have made, and "he hopes the Local Government Board may be moved to adopt the uniform system of accounts in the isolation hospitals all over the country."

I have also forwarded a copy of my report to the general secretary of the Royal Infirmary, Manchester, who is a recognised authority on hospital finance. He writes that he is of opinion that the accounts suggested are the minimum which should be kept to permit of accurate comparisons, and that the order form with its invoice and analysis is essential to the system. The proposals he regards as having the advantage of simplicity, and gives it as his opinion that the hospital committees adopting them will have very little trouble with their accounts.

If I can induce the medical superintendents of the provincial hospitals to adopt this system, so that we can compare the cost per occupied bed space, per annum, I feel confident that we shall be able to effect a saving proportionate to that which has been effected by the King Edward's Hospital Fund. It is only by comparing one hospital with another

that laxity can be detected. I venture to bring this matter before this Society in the hope that if they approve of my suggestions it will have some weight with the Local Government Board and lead them to suggest a general form for an abstract of accounts to be published annually from every isolation hospital.

DISCUSSION.

THE CHAIRMAN (Dr. E. C. Seaton) at the conclusion of the reading of the paper, congratulated Dr. Barwise on the manner in which he had treated the question. They were, he said, all concerned in the question of isolation hospitals, and had before them the problem of the great expense of those hospitals, especially as regarded scarlet fever isolation. The paper was exceedingly lucid, and he had no doubt it would prove very profitable. He hoped to hear a good discussion upon it.

DR. BURMAN spoke of the importance of a uniform system of keeping hospital accounts, and said that without some such system it was impossible to compare the expenditure of one hospital with another.

DR. GRIFFITH said that, even if hospital accounts were kept on a uniform scale, more data were necessary for the purpose of accurate comparison. The calculation ought to have regard, *inter alia*, to the diseases admitted, the number of beds with full air space, the number of patients in the year, the number of average patients, and the extent of the population served by the hospital.

DR. WILLIAM BUTLER spoke of the importance of the subject which had been dealt with by Dr. Barwise, and said the question of hospital expenses was one with which medical officers must familiarise themselves.

DR. H. MEREDITH RICHARDS said that in his hospital they had adopted a modification of Burdett's method of keeping accounts, but it was surprising what great variations there were from year to year. One important consideration was whether or not they were isolating scarlet fever. Dr. Barwise's suggestion for dividing staff expenses from those of patients was a very valuable one. He (Dr. Richards) characterised the dietary system as an idiotic one; the safest way to secure economy was to have a good matron and housekeeper. Dr. Barwise would have done excellent work if he succeeded in getting a more uniform system of keeping accounts introduced throughout the country generally.

DR. E. S. DAVIES said he was not able to add very much on this question, as the hospital accounts in the city of Bristol were left largely to the accountant. But it was obvious that if they compared the cost per head in a hospital of 200 beds with that in one of 400 beds, the expenditure per head would be very much greater in the case of the smaller hospital.

DR. HERBERT JONES said that in the rural districts hospital accounts were kept very much in the same way as workhouse accounts; that was to say, the staff and the patients were put on rations. In the case of one hospital over which he had

superintendence, the principle he had adopted was to allow the nurse in charge to order practically what she liked within certain limits. His experience was that the cost of the hospital on this principle was 20 per cent. below that of the hospital in which rations were given. He thought they ought to set their face against the principle of conducting hospitals on the irrational principle of rations.

DR. F. E. FREMANTLE recorded his experience two or three years ago when making an exhaustive study in regard to isolation hospitals, and stated that he found it impossible to get at the bottom of the question of expenses owing to the different returns not being comparable. It was very important that there should be some uniform system. Such a system would not only be of great value, but would undoubtedly lead to economy. He thought the Society might approach the Local Government Board with a request that they would lay down some such system as indicated by Dr. Barwise.

DR. SIDNEY BARWISE, in replying to the discussion, said it would be better not to approach the Local Government Board until the matter had been considered by the council or by a special committee interested in this question. But he thought they might, without delay, call the attention of the Local Government Board to the absurdity of the power given in sub-section 3 of section 17 of the Isolation Hospitals Act, whereby, in the case of any doubt arising as to what were structural expenses, establishment expenses, or patients' expenses within the meaning of the Act, the decision of the hospital committee was conclusive. The difficulty could be got over by adopting a schedule, and providing that, in case of doubt, the Local Government Board should decide. He agreed that if the annual statements with regard to isolation hospitals were to be of any value, they should specify the diseases isolated. Enteric fever and scarlet fever, for instance, were by no means on the same scale. The Local Government Board's dietary system had only been adopted, he was glad to say, in one district in Derbyshire, and after a little time was abandoned. The two Government auditors had gone into this matter of keeping the accounts, and were in agreement with him; and so far as Derbyshire and, he thought, Nottinghamshire, were concerned, the system he had outlined would no doubt be adopted.

DR. FREMANTLE moved—

"That the council be asked to consider the desirability of suggesting to the Local Government Board that Boards should provide for the uniform keeping of the accounts of isolation hospitals."

DR. BARWISE, in seconding the motion, asked Dr. Fremantle to add—

"and that the Local Government Board's attention be drawn to the necessity of revising sub-section 3 of section 17 of the Isolation Hospitals Act."

DR. FREMANTLE accepted the addition, and the motion was agreed to in this form.

ISOLATION IN ISOLATION HOSPITALS.

By H. E. CORBIN, B.Sc., D.P.H.,

Medical Officer of Health, and Medical Superintendent of the Isolation Hospital, Stockport, late Medical Superintendent of the London Fever Hospital.

IN a paper on "The Influence of Hospital Isolation on Scarlet Fever," by Dr. Killick Millard, read before the Incorporated Society of Medical Officers of Health, February, 1901, Dr. Millard concludes:—

1. That the hospital isolation of scarlet fever appears to have failed materially to reduce the prevalence of the disease.

2. That the hospital isolation of scarlet fever appears to have failed materially to reduce the fatality of the disease.

3. That the fatality of the disease has fallen most on those large towns which have not practised hospital isolation.

He has come to these conclusions by an appeal to statistics.

In a later paper read before the same Society, Dr. J. R. Kaye shewed the futility of comparing small groups of towns with reference to the isolating policy, without having regard to all the factors involved, such as position, social character of the people, housing accommodation, thoroughness of notification, and compulsory school attendance.

We know so little of what have been called "epidemic influences" that we have no means of determining what would have been the prevalence, or the mortality of the infectious fevers without isolation hospitals. It is in the very nature of every disease which is caused by a specific organism, to undergo in the course of years more or less sudden variation, both in incidence and in virulence, and it is probable that the increased incidence from infectious diseases, giving rise to epidemic peaks and plateaux is an indication of an increase in the infectivity of the invading micro-organism due to conditions of environment which are favourable to it, or which in some way reduce the resistance of those which it attacks, or, perhaps, a combination of these. A crest in a wave of infectivity may occur at the same time with a trough in a wave of resistance in a community, the result being an epidemic peak. As to what are the influences at work which determine and bring about these changes, we must, unfortunately, confess a large amount of ignorance.

In the discussion on Dr. Kaye's paper, Dr.

Malet, of Wolverhampton, mentioned the results of some valuable inquiries he had made in cases of scarlet fever, as to the number of infectable children in houses from which the patients were removed to hospital (as a rule overcrowded houses), and in houses where isolation was possible, and the patients were not removed to hospital. During eight years he had cases from 1,758 houses in which 4,864 infectable children (not having had scarlet fever) remained. Cases were treated in 228 houses with 468 children remaining infectable. Of the children left at home after hospital removal, 4·8 per cent. contracted scarlet fever. Of the children in the houses isolated at home 28·2 per cent., or more than six times as many contracted the disease.

These facts are quoted as shewing the unquestionable value of removing cases to hospital, and though it is not my intention in this paper to discuss in detail the question as to whether isolation hospitals have diminished epidemic prevalence or lowered mortality, it seems to me, from the definition of the word infectious, *to be an axiom*, that the removal of an infectious patient to a hospital will minimise the possibility of the disease spreading; and that isolation hospitals, notwithstanding adverse criticism, constitute not the least of many important factors in the organization to promote public health.

In the year 1862, "certain non-professional sanitary reformers proclaimed to the world that all cases of infectious disease ought to be distributed through the wards of a general hospital, and denounced the London Fever Hospital (then the only fever hospital in London), as a crime against humanity." The objections urged were two:—

1. That the concentration of the poison increases the mortality among the patients themselves.

2. That the concentration of the poison increases the danger to the attendants.

"The validity of these objections may be tested by comparing the results of the London Fever Hospital during the year 1862 with those of six of the principal general hospitals of the metropolis.

"During the first six months of 1862, 1,107 cases of true typhus were under treatment in the London Fever Hospital, of which 232 died, or the mortality was 20·95 per cent. In the same period, 343 cases of typhus were under treatment in six of the general hospitals in London (St. Bartholomew's, Guy's, St. Thomas's,

Middlesex, St. Mary's, and the German Hospital); of these 343 cases, 80 died, or 23·32 per cent. The 1,080 (1,107-27) cases admitted to the fever hospital communicated the disease to 27 persons, of whom 8 died. In other words, only one person took the fever for every 40 admitted, and only 1 died for every 135. But the 272 cases admitted into the six general hospitals, communicated the disease to 71 persons, of whom 21 died, or 1 person caught the fever for every 3·1 cases admitted, and 1 was lost for every 12·9 cases admitted. It appears from this that the objections raised against the fever hospital, however plausible in theory, are not justified by facts, and that a given number of typhus patients can be treated on the plan of isolation, with equal advantage to themselves, and with far less danger to the attendants and other patients, than in the wards of a general hospital."—(Extract from Report of the London Fever Hospital, 1862).

From the opening of the London Fever Hospital in 1802, up to 1863, no separation between the patients suffering from different diseases admitted into the hospital was affected, but on account of the frequency with which the patients contracted other diseases than those for which they were admitted, it was deemed necessary to adopt the plan of isolating in separate wards the typhus and scarlet fever patients from the other patients, and from one another. The results were most satisfactory.

Since then much has been effected throughout the country towards increasing and rendering efficient the policy of the isolation of infectious diseases, and it is with the object of advocating greater efficiency in isolation that I have given the title of "Isolation in Isolation Hospitals" to this paper, and in order to promote discussion, and to learn the views of others.

Until within the last few years, very little accommodation was provided for complete isolation of cases admitted to the fever hospitals. Inadequate isolation accommodation not infrequently necessitates the exposure to infection of cases not suffering from the disease for which they are sent to hospital, and also increases the possibility of the introduction of other infectious diseases into the wards.

Cases requiring complete isolation are:—

1. Doubtful cases.
2. Cases in which two infectious diseases co-exist.

3. Cases of one disease which have been exposed to another infection before admission to hospital.

4. Cases suffering from infectious complications.

5. Verminous cases.

6. Other diseases not infectious.

With regard to the separation of cases suffering from infectious complications, much discussion has taken place. The so-called isolation of the infectious diseases, as carried on at the present time, really consists of aggregation of cases suffering from similar diseases, the extent of this aggregation being determined by the size of the wards and the number of patients treated within them at a given time; in other words, upon the cubic space per patient.

Overcrowding of patients in a ward unquestionably increases the incidence of complications, such as otorrhœa, adenitis, and rhinorrhœa, and to what other cause can this be attributed than that these conditions are infectious? To allow that they are more frequent in overcrowded and ill-ventilated wards is to admit that they are infectious, and I am inclined to the view that even 1,000 cubic feet of air-space in a well-ventilated room, completely separated from other patients, is of more value than an average of 2,000 cubic feet of air space, which is common to a large number of patients suffering from an infectious disease.

Dr. Cameron, in his report on "Return Cases," after discussing various views on the matter, says: "It follows from the evidence, which I have adduced elsewhere, that the limitation of 'return cases' lies in the direction of preventing the spread of complications in hospital."

A rough classification of acute and convalescents into different wards is now adopted in many hospitals with a view to securing greater freedom from infection and to diminish the possibility of return cases. This method is older than is generally supposed, for in the report on the hospitals of the United Kingdom, published by the medical officer of the Privy Council in 1864, it is written of the London Fever Hospital: "It seems to us, too, that the plan on which the convalescent wards are conducted, in virtue of which convalescents are removed from the infected atmosphere of the acute wards and 'sorted,' so as to guard them as much as possible from all risk of contagion, is worthy of special notice."

In a recent lecture on the "Treatment of Infectious Diseases," Dr. E. W. Goodall, speaking of diminishing "return cases," says: "The employment of separate wards for severe and mild cases does not appear to be of any avail towards this end."

With regard to the influence of aggregation of cases in a ward on the incidence of infectious complications, I find that in the case of 794 patients admitted into the general scarlet fever wards at the London Fever Hospital, 383 suffered from infectious complications or forty per cent., while in the case of 66 patients treated throughout in single rooms 12 suffered from such complications or 18.2 per cent. I have included in the term infectious complications, otorrhoea, rhinorrhoea, adenitis, secondary tonsillitis, and nephritis.

Now as to what extent isolation should be carried out, and what should be the proportion of isolation rooms per cent. of patients. The medical superintendents of the Metropolitan Asylums Board, in commenting on Dr. Cameron's report on return cases came to the conclusion that 20 per cent. of the total beds should be set aside, 10 for mixed infectious and 10 for doubtful cases, and "other diseases."

Dr. J. J. Clark, of Walthamstow, in a personal communication, expressed the opinion that every case of diphtheria should be treated throughout in cubicles, and that 40 per cent. of the scarlet fever beds should be in cubicles, the patient being treated in these until throat, gland, and ear symptoms are absent.

It is a far cry from the present system of aggregation to that of complete isolation of so large a proportion of patients, or still more, to the ideal system in which every patient is kept apart from the time of entry to that of exit from hospital.

Let us now consider what methods have been adopted in this direction, and how far up to the present they have been successful.

Perhaps the most well-known instance of a hospital in which every case is, at least for a time, isolated in a separate room, is the Pasteur Hospital, in Paris. In the centre of each pavilion there are twenty-four *chambres d'isolement*, or boxes, arranged in two storeys of twelve each. The cells are arranged six on either side of a central corridor. Each of these opens into the central corridor, and on to an outside balcony. The cells are separated into pairs by brick walls, while the division of each pair, and also

the whole front facing the corridor, consists of a brick wall up to about 3 feet from the floor, and glass from this to the ceiling. Complete absence of air communication is thus brought about when the door is closed, and the materials used in the construction of the cubicles are such that they can readily be washed and disinfected. Each cubicle is 11 x 9 feet, and has a cubic content of about 1,500 cubic feet. Hot and cold water is supplied to each cubicle.

Dr. Louis Martin, the resident physician, describes in *Le Bulletin Medical*, 19th March, 1904, a copy of which he kindly gave me, the régime of asepsis, which is carried out by the doctors and nurses in order to prevent communication of diseases, and which, apart from the wearing of a separate overall for attendance on each patient, consists of the ordinary principles of asepsis. Dr. Louis Martin states that in about two and a half years, 2,000 patients were treated, comprising 443 of diphtheria, 524 of smallpox, 55 of chicken pox, 126 of measles, 92 of scarlet fever, and 163 of erysipelas; the remainder being doubtful or non-infectious cases.

Every case admitted is vaccinated when the hospital contains small-pox cases, and every infant under three years receives a prophylactic injection of antitoxin when there are diphtheria cases in the hospital.

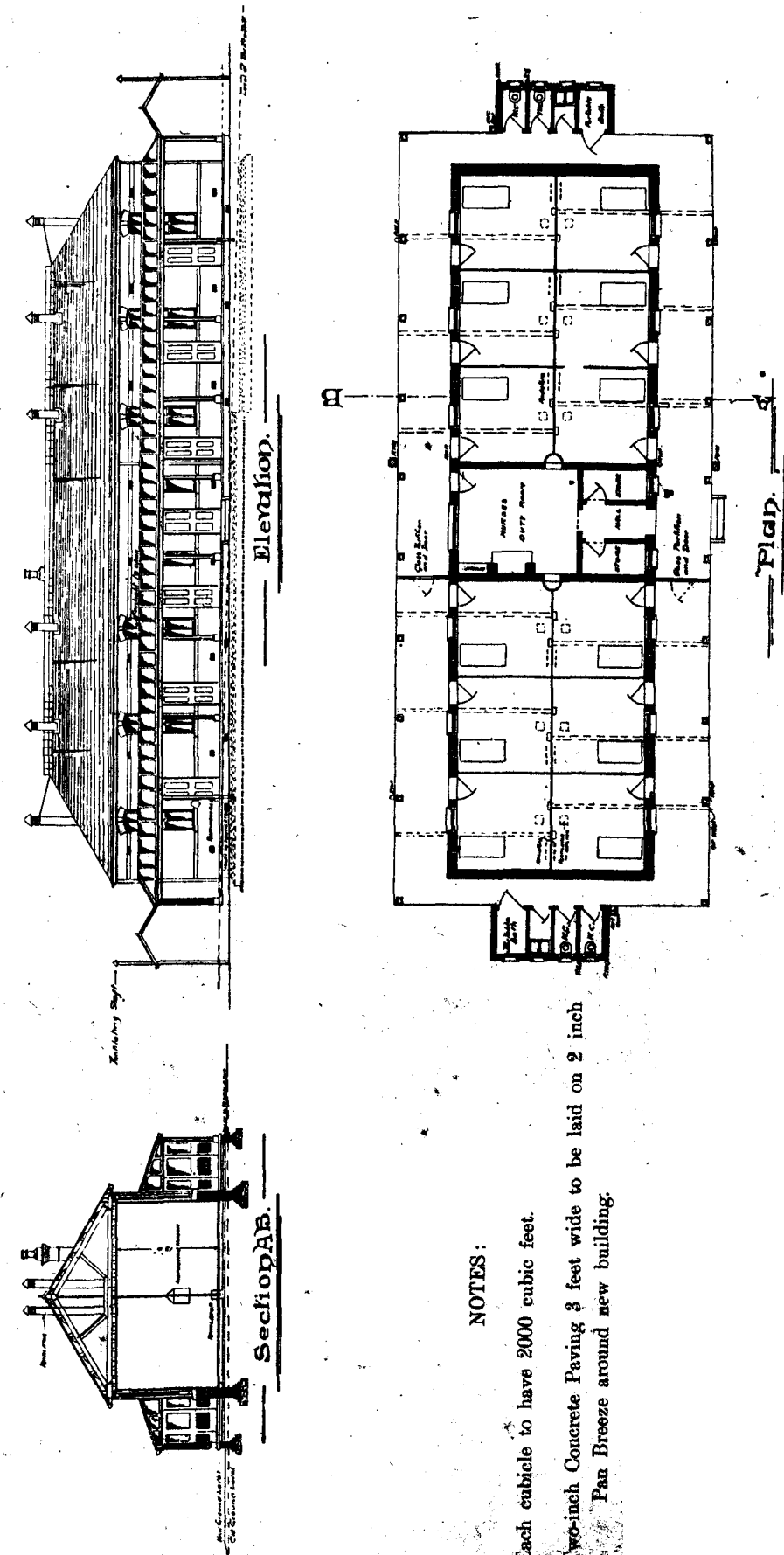
Dr. Martin states that only six cases of cross-infection occurred—four of small-pox and two of erysipelas—or 0.3 per cent. of the 2,000 cases.

Such figures clearly show the practicability of such an arrangement for the treatment of infectious diseases, when administered in an efficient manner.

The nearest approach to this that we have in England is at the Isolation Hospital of the Walthamstow Urban District Council, where there is a twelve-bed pavilion, consisting of glass cubicles, designed by Mr. G. W. Holmes, A.M.I.C.E., the council's engineer, in consultation with Dr. J. J. Clarke, medical officer of health. A central nurses' duty room divides the pavilion into two sets of six cubicles, each with 144 square feet of floor space and 2,000 cubic feet of content. The dividing partitions are of concrete to a height of 2 feet, the remainder being of glass, which reaches to the ceiling. Each cubicle has a window and a door which opens to the outer air. A verandah overhangs the doorways on either side of the building. Ventilation is effected by the windows, and

WALTHAMSTOW URBAN DISTRICT COUNCIL ISOLATION HOSPITAL.

PROPOSED 12-BED BLOCK.



NOTES:

Each cubicle to have 2000 cubic feet.

Two-inch Concrete Paving 3 feet wide to be laid on 2 inch

Pan Breeze around new building.

by an air duct which comes up through the floor and conveys air from the opposite side of the building. Each cubicle is heated by a radiator. Between every two cubicles, outside the building, is a lavatory basin with hot and cold water fitted. The chief disadvantage of this arrangement appears to be the exposure of the nurses to inclement weather, as they have to go outside from the duty room in order to enter a cubicle, and to wash their hands outside before passing from one cubicle to another. Mr. Holmes has been kind enough to send me plans of this pavilion, which I am able to show you, and I am indebted to Dr. Clarke for some details as to the results obtained. He finds that isolation of different diseases in adjacent cubicles is ample and adequate. Diphtheria, scarlet fever, measles and whooping cough have been treated side by side in the pavilion, and no secondary infection has arisen. Moreover, he finds that if patients get bad throat symptoms in the general ward, removal for a few days into a cubicle at once effects an improvement without medicinal treatment. The nurse's toilet consists of putting on a cloak on entry to each cubicle and thoroughly washing the hands. From the observation windows of the nurse's duty room, all twelve patients can be seen at once, and at night the electric light may be turned on in each cubicle from the duty room.

A pavilion constructed on the cubicle system would be a great economy to small local authorities, as it would no longer necessitate two blocks, one for scarlet, and one for diphtheria. There would, moreover, be an economy in the nursing, and if one disease was epidemic, all the beds could be used; while if separate special blocks exist for two diseases one of these is frequently nearly empty, while the other is overcrowded.

Dr. Foord Caiger has kindly supplied me with some particulars as to the conversion of two large wards into cubicles at the South-Western Hospital of the Metropolitan Asylums Board, in order to supplement the existing isolation.

In these cubicles only partial isolation is effected, as the partitions reach only 7 feet above floor level, and fall considerably short of the ceiling. Dwarf doors about 3 feet high are provided, opening in the central corridor. These are arranged so that the door of one cubicle is not opposite to that of another, and while preventing a child from getting out of

the cubicle, allows free circulation of air among the cubicles.

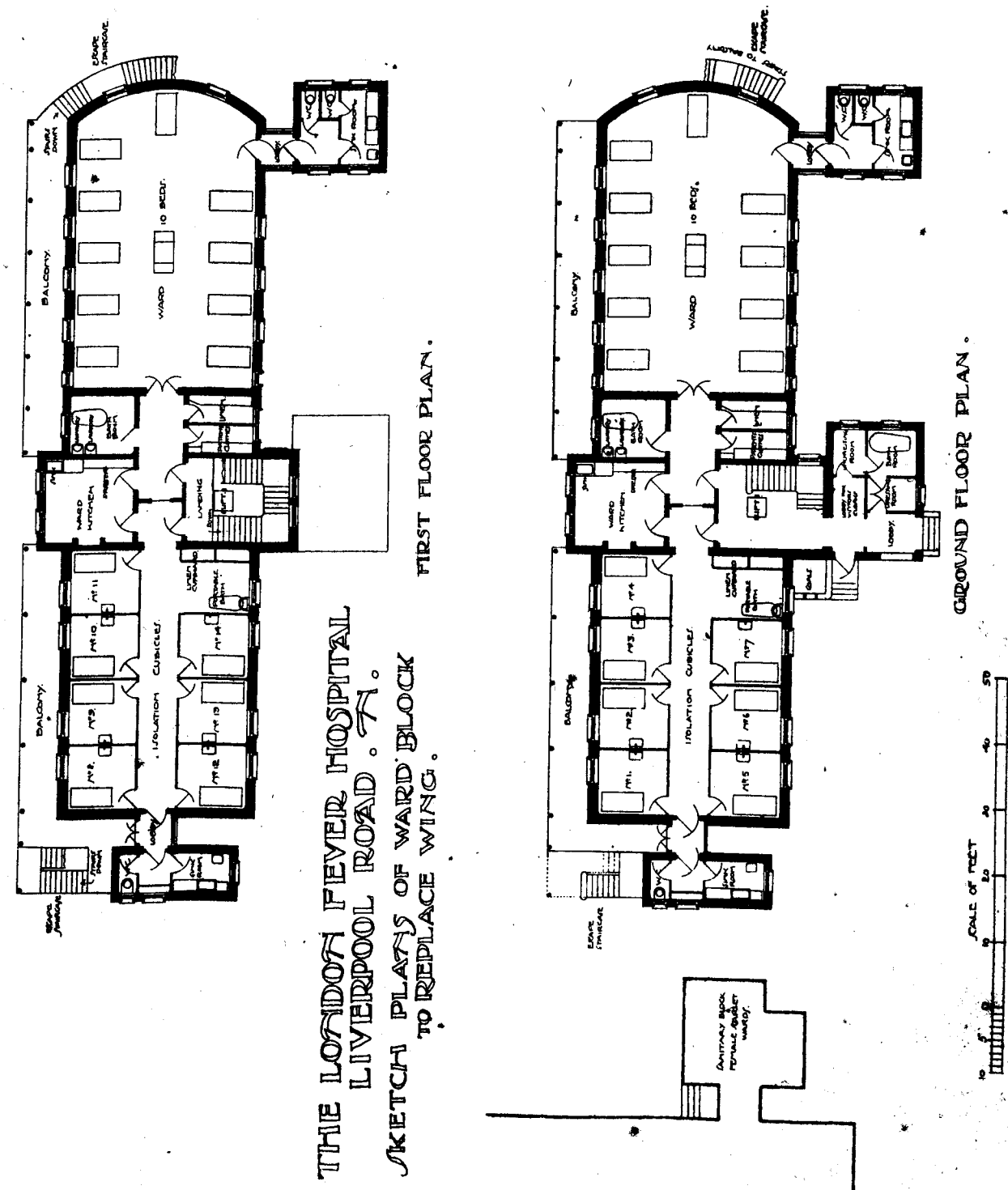
Dr. Caiger states, in a small memorandum referring to these cubicles, "It is believed that for certain cases sufficient protection is furnished by the relative isolation afforded by cubicles, *provided* scrupulous care is exercised by the attendants, both medical and nursing, who are entrusted with their administration. The principle underlying the system is, of course, "aseptic" in its conception."

For the present, the cubicles will be exclusively utilized for temporary isolation of doubtful and anomalous cases, and for certain recognised attacks, which are believed to be unattended with a high degree of infectivity. I look forward with interest to Dr. Caiger's results; they will be specially interesting as an indication of how far one can go with only partial isolation of certain of the infectious diseases.

Mr. Keith Young, F.R.I.B.A., has kindly furnished me with a copy of sketch plans of a proposed new ward block at the London Fever Hospital. The designs are for a two-storey block for 36 patients, each storey consisting of a ten-bed ward on one side, and a group of seven isolation cubicles on the other, separated by a ward kitchen and staircase. Each ward, as well as each series of cubicles, is provided with a sanitary annexe.

As these are sketch plans, and necessarily incomplete, I will not describe them in more detail; but such an arrangement, while providing ward accommodation for patients suffering from a common disease, affords also excellent accommodation for the complete isolation of either distinct diseases or of patients which it is deemed advisable should be removed from the ward. Such a block would, I believe, materially add to the efficiency and facility of administration of a hospital, in which isolation accommodation is too limited, or would serve excellently as the entire hospital accommodation for a small authority, who wish to provide small general wards for scarlet fever and diphtheria, as well as isolation for doubtful and other cases. For while available for any disease which is at the time prevalent, the presence of the cubicles adapts the block for admission into hospital of every case of whatsoever infection that it is thought desirable to isolate.

In this paper I have attempted to bring an important subject before you. While it is universally agreed that adequate isolation is



necessary for doubtful cases, dual infections, intercurrent infections, "other diseases," and such like, it is with the insufficient data so far available, a debated point, and up to this time experimental, whether aggregation of cases suffering from one disease is responsible for increased infectivity or prolonged infectivity, and also whether complications, such as adenitis and otorrhoea, are commoner in ward cases than in cases isolated throughout; and, moreover, if, by a system of more complete isolation, either partial or total, it is possible to limit or abolish the much-discussed return cases, or even diminish the incidence of the disease apart from these.

These are questions of much interest and importance, and though cognizant of my inability to deal adequately with the subject, I have dealt with it with the idea of learning the views of those who have had greater experience, and are more able to judge of these matters than myself.

OVERPRESSURE IN THE SCHOOLS OF FRANCE (La question du surmenage scolaire).—Dr. Albert Mathien (*Internat. Mag. of Sch. Hygiene*, IV. Band 4 Heft. Feb. 1908) writes strongly on this subject. He says that until but a year ago the children in the écoles maternelles were herded together under most undesirable conditions; there were no playgrounds and no spontaneous activity encouraged or even allowed; while subjects designed for children of from ten to twelve years of age were prematurely begun. [The écoles maternelles correspond with our infants' departments and are attended by children from the age of two to six; over a million children below the official lower age limit attend these schools.] In the elementary schools for children from 6 to 13 years of age, the hours correspond with those in England, from eight to eleven in the morning and from one to four in the afternoon; but, in addition, much homework is given. He gives the example of a girl of 12, coming home from school at four, starting home lessons at five, going to bed at ten; rising at five and doing home lessons again until school time at eight. The result of this, says Dr. Mathien, is wholesale depreciation of health; amongst other things, neurosthenia and corresponding nervous disorders are rife, while dyspepsia and even dilatation of the stomach may be traced to the same cause. The health of the children is greatly improved during the holidays, but the improvement disappears soon on resuming school. Fatigue is a normal phenomenon, the manifestations of which are important warnings; danger commences when this warning is unheeded or not obeyed. Dr. Mathien refers to the aesthesiometric method as very valuable and offering a means of classifying children, so that undue tasks shall not be demanded from those showing little resistance to fatigue.

THE SCHOOL DENTAL CLINICS OF GERMANY.

By C. EDWARD WALLIS M.R.C.S., L.R.C.P., L.D.S.
Assistant Dental Surgeon, King's College Hospital, Dental Surgeon, Victoria Hospital for Children, Chelsea, and London County Council School, Feltham, etc.

DURING the last ten years many series of careful observations have been made with a view to finding out the amount of dental disease existing among the elementary school children of this country, and all observers agree that the amount of decay is enormous, that the ignorance of the community on the subject of the teeth may almost be described as abysmal, and worst of all that, speaking of the country as a whole, little or nothing worthy of the name is being done either as regards the prevention or treatment of dental caries, the commonest disease to which civilized Europeans are subject.

Let us now turn to that home of educational progress, Germany, and what do we find.

Thanks to the untiring efforts of Professor Jessen of Strasburg, somewhere between twenty-two and twenty-nine cities in that country have either in existence or in process of formation school dental surgeries, or "Schule-Zahn-Kliniken," to deal with the teeth of their elementary school children.

Strasburg, being the pioneer city, it will be of interest to deal with the way in which Professor Jessen succeeded in impressing upon the municipal authorities the seriousness of the dental situation in the schools, and the steps to be taken to deal with the matter.

Perhaps one ought to mention here that the population of Strasburg is given as 150,000, that is to say, it is about the same size as Sunderland, and its elementary school population is given as 19,134 children.

In 1895 Professor Jessen, in the face of great opposition, obtained permission to examine the teeth of the school children of Strasburg, and after examining some 10,000, his statistics showed that but 4.3 per cent. had healthy dentition—a proportion which, though bad enough, is not nearly so bad as was shown at the Michael Faraday School in Walworth, where only 1.63 per cent. were found to have healthy sets of teeth when examined by the writer in 1906.

For some time after this, Professor Jessen had in existence, at his own expense, a school dental clinic, at which he was able to treat a certain number of children; but it was not until 1902 that the municipal authorities went

so far as to enable him to open the present school dental surgery, and already the work has so overgrown the institution that a new one is being erected as part of the municipal bathing establishment which is now approaching completion.

The present institution is by no means an ambitious one. It forms part of the children's polyclinic of Strasburg, and consists of two surgeries, with three operating chairs between them. All the rooms are situated on the first floor and lead into one another, so that the children can be kept well under observation while waiting their turns for treatment.

The waiting-room accommodates about sixty children, though probably, except when a large number happen to be present for inspection, so many would seldom be wanted at the same time.

An important feature of this waiting-room is that the walls are hung with dental charts, diagrams and so forth, all coloured and explained in simple language so that the children while waiting may amuse themselves by looking at them, thereby acquiring in an easy way some of the essential points relating to the preservation of their teeth.

The work that is done at the school clinics is confined to extracting, root treatment and fillings, nothing that takes an undue proportion of time or that would be expensive is undertaken.

This applies to the institutions at Strasburg, Mulhausen and Darmstadt, but it is certainly possible that elsewhere a demand might arise for the carrying out of elaborate and prolonged operations such as the undertaking of regulation cases involving much time and expensive apparatus, which would, besides these disadvantages, necessitate a disproportionate amount of time being spent on individual children.

The way in which the dental work is arranged in the city is as follows: the senior dentist to the school clinic visits each school in turn for the purpose of inspecting the children's teeth, and incidentally impresses upon them the importance of keeping their teeth clean, and of eating hard rye bread in order to strengthen their jaws and develop their teeth.

In the case of those children who, after inspection, are found to require treatment, and also in the case of a child who may complain of toothache during schooltime, the teacher at once sends a printed card to the following effect:—

MUNICIPAL INFANT SCHOOL OF STRASBURG.
To the Parent of the Child.

Your child has diseased teeth and requires dental treatment. This can be obtained in the municipal school dental clinic, 12, Elizabeth Street, and there your child will obtain the necessary treatment.

Children with diseased teeth will not be allowed in the infant school, because their own health and that of other children is endangered thereby. I therefore ask whether you agree to the necessary treatment, which will be efficiently carried out free of cost to you.

Strasburg. Date.....
..... Infant School.
..... Head Mistress.

Reply of Parent.

I agree that the necessary treatment be carried out.

(Signature)..... Parent.

In the case of the older children, that is to say, those not attending the "Infant" schools, a card to the following effect is sent to the parents of those requiring treatment:—

Municipal School Dental Clinic,
12, Elizabeth Street, Strasburg.

Hours of Attendance:—8—12 and 2—5 daily.

Your child has diseased teeth; you are therefore strongly recommended to send or take the child on the next

Date..... at..... o'clock.
The child must bring this card.
Name. Three visits. Was present from..... o'clock.

Besides this, an important feature of this school dental work is the instruction of the school teachers in the principles of dental hygiene, so that they may in turn impart it to the children under their care, and to aid them in this a large dental hygiene chart, such as has been published in England by the School Dentists' Society, is hung on the walls of each school.

Realising also that the efforts of the school teachers alone would be insufficient, a further plan was instituted of instructing the parents by means of dental-hygiene lectures on what are called "Parents' Evenings"; these at the present time are not as a rule given by the staff of the school dental clinic, but by members of the local dental society which is in itself a valuable evidence of the fact that the existence of the schule-zahn-klinik is favourably regarded and supported by outside dental practitioners.

The view they take appears to be that, the earlier the children have their attention called to their teeth in a proper way, the better will it be for both patients and practitioners when the children have grown up and learnt the importance of preserving their teeth. To summarize, therefore, we see that the prin-

ciples involved in preserving the teeth are taught the children—

- (1) In the schools by their teachers.
- (2) In the homes by their parents.
- (3) In the school dental clinics by the dentists.

The principle of compulsion in the matter of dental treatment is not adopted except in the infant schools, where no child is allowed to attend that has diseased teeth, because, as is stated in the notice sent to the parents, "the child's own health and that of other children is endangered thereby."

In the case of the children that are not infants, no compulsion in the ordinary sense of the word is used, but a form of indirect pressure in the shape of certain disabilities, such, for instance, as that no child is allowed to go to a "holiday school" without having a certificate from the school dental surgery that the mouth is healthy.

With regard to the subject of tooth cleaning, which many in this country seem to find very difficult, the plan is that the school teachers instruct the children in the proper way of cleaning their teeth, and the children themselves are supplied with tooth brushes at 4d. each, those unable to afford this sum being supplied with tooth brushes free of cost by the municipality.

This matter of cleaning the teeth, though difficult, is, in my own experience, quite possible of attainment. When dentist to the Bostall Woods Open-air School last year, thanks to the co-operation of the headmaster, the teachers and the school nurse, within a month a marvellous change was wrought in the cleanliness of the teeth, which when first inspected were seen to be almost filthy beyond description.

Of the twenty-two German cities of which I have been able to collect the necessary information, fifteen have a regular staff of municipal dentists who work at the dental clinics, while five have adopted the plan of sending their children to be treated at the dentists' private surgeries; these latter, however, are chiefly cities in which the elementary school population is small, such as is the case in Nordhausen, where the school population is only 3,600, which is divided amongst four private dentists. There is, however, an exception to this, and that is Wiesbaden, where 8,000 children are attended to by six private dentists.

The salaries paid in the various dental clinics are certainly less than would have to be

paid for the same work in this country, and vary from 800 marks (£40) per annum to 5,000 marks (£250) per annum. These salaries vary, of course, with the amount of work to be done, and also depend upon whether private practice is allowed or not.

In Mulhausen, which has 100,000 inhabitants and a school population of 14,000, one dentist is appointed to devote his whole time to the work at 3,600 marks (£180) per annum. The school dental clinic of this city is remarkable in that the dentist only works during the times the children are not in school; thus his daily hours are 8 a.m. to 9 a.m., 11 a.m. to 12 noon, 4 p.m. to 6 p.m.

This plan of attending to the teeth of the school children might conceivably be carried out in the country, but it would lead to endless difficulties if it were proposed to treat the school children before 9 a.m. in the morning; and on Saturdays also there would probably be much difficulty, as it is on these days that so many of the school children have to help their parents with their buying and selling, at any rate in large cities.

In Strasburg, the staff at the dental clinic are particularly active during the school holidays; here again it is open to discussion whether, during the school holidays, the children could be induced to attend to have their teeth seen.

The plan of sending the children, that after dental inspection have been found to require treatment, to the clinic in batches day by day appears to be the most likely to succeed, and that is the plan that should certainly be tried first of all. Probably the total time spent at the dental clinic by each child from an infant school would not exceed half-an-hour, which would certainly not be an excessive period to devote to so important a matter as making the oral cavity healthy.

Visits to the school dental clinics, and also to typical representative elementary schools in Strasburg, Mulhausen and Darmstadt, showed plainly the benefits derived from systematic dental treatment. In London, in schools of the same description, one would see on all sides the inevitable consequences of dental neglect, such as anæmia, enlarged glands, abscesses, ulcerative stomatitis and so forth, all having a serious effect in hindering the physical and intellectual development of the sufferers.

Professor Jessen states that, as a result of his experience, there is no department of public health in which so great a return is obtained from so moderate an expenditure of public money.

REVIEWS.

INTERNATIONALE UEBERSICHT UEBER GEWERBEHYGIENE nach der Berichten der Gewerbe-Inspektionen der Kulturländer. (International Review of Industrial Hygiene, based on the Reports of the Inspectors of Factories in civilised countries). By Dr. E. J. Neisser, Berlin, 1907.*

This is an attempt to compare the activities of Germany, Austria, Switzerland, Great Britain, France, The Netherlands, Belgium and the United States, as regards (1) Diseases of occupation (2) Sanitation (including ventilation, temperature, lighting, humidity, removal of dust, washing and bath accommodation), and (3) arrangements such as dining rooms, kitchens, etc., which make for the welfare of persons employed. In each country the published reports during the year 1905 of the several factory departments are taken as the basis for comparison. By far the most useful figures as to incidence of lead poisoning and anthrax are contained in the British report. It is very difficult to get any idea of how much poisoning is going on in Germany, and in other countries owing to the absence of compulsory notification. There is mention in the Prussian section of very high figures in smelting works (177), in white lead works, and in the manufacture of electric accumulators, but the figures are nowhere brought together and totalled up as is done in Great Britain for the several industries. And in the principal tabulation besides grouping "lead colic" and "lead paralysis" in one and the same column, there are other columns for "kidney disease," "gastritis," "lead anæmia," "rheumatism," "diseases of the eye," but no information is given as to whether all these are to be associated with lead poisoning. As in this country, so in the Netherlands, great attention is paid to the pottery industry and there the same methods of analysis of glazes which were suggested by Professor Thorpe appear to be followed, although the standard of solubility has for a time, at any rate, been fixed at a higher figure. The periodical medical examination of the workers also appears thoroughly carried out in the Dutch potteries. In Belgium, periodical medical inspection is required in white lead factories, for those engaged in house painting operations, and in lucifer match factories where yellow phosphorus is used. Uniformity in the method of carrying out this work seems lacking and very difficult of accomplishment in the case of house painters.

Details of half-a-dozen cases of phosphorus necrosis in Germany and Austria are given, and in Switzerland it would appear that although there has been disuse of yellow phosphorus, periodical medical examination is still required of workers employed in lucifer match manufacture by means of sesqui-sulphide of phosphorus, and that exhaust ventilation is enforced in the process of dipping. In Belgium, examination of the workers by a surgeon, and not by a dentist, charged with the duty of treating defective conditions of teeth, leads

* Pages 352. Bibliothek fuer Soziale Medizin. No. 1. Gutenberg, Berlin, 1907.

evidently to frequent suspension of the workers; and probably to a more summary process-extraction instead of stopping of defective teeth.

An account is given of symptoms of illness noted in a factory in Saxony which have never been observed in this country, due to the dust in the grinding of manganese—pallor, debility, headache, giddiness, tingling of arms and legs, with, in one case, paralysis of the arms.

In the whole of Germany reference is made to only 20 cases of anthrax in tan-yards and horse-hair factories. None are reported as having arisen in the woollen trade. In Austria there were 13, in Switzerland 2, in the Netherlands about 12, as compared with 59 in Great Britain. The only conclusion to be drawn from these figures, is that in the absence of compulsory notification, no idea can be gained of the prevalence of anthrax in other countries of Europe.

The book is undoubtedly useful and brings together much information which otherwise could only be obtained after considerable search.

RUMMAGE. By H. C. P. Pattin—London, Sidney Appleton—1908.

In this little book the versatile Medical Officer of Health of Norwich again makes his appearance in the rôle of miscellaneous essayist, and the readers of his former books will find no falling-off in this. Dr. Cooper Pattin turns upon the world the eye of a keen and practised observer, and discourses upon many varied aspects of human experience with a nimble wit, and a mellow and kindly humour that make very pleasant and entertaining reading. All old Cambridge "medicals" owe him a debt of thankfulness for his charming character sketch of the late Sir George Humphrey—which is in some respects the best piece of work in the book. Dr. Cooper Pattin has an original point of view and a genuine literary endowment, and in his exuberant wealth of adjective and felicity of expression he is no unworthy disciple of the greatest of the physicians and citizens of Norwich—Sir Thomas Browne. We feel strongly tempted to quote certain delightful passages from the paper entitled "My Aunt Sarah and her Naval Spouse," but must content ourselves with recommending the whole book to all who appreciate good work in the gentle art of essay-writing.

"Rummage" deserves and will doubtless secure a wide circle of readers, but there are those among Dr. Cooper Pattin's many friends who may feel some regret that its gifted author should give up to *belles lettres* what was meant for epidemiology and mankind.

USING BAD EGG ALBUMEN IN NOUGAT. — At Thames Police Court, on Jan. 28th, Samuel Noah, manufacturing confectioner, Mile End, was fined £50 and £5 5s. costs at the instance of the Stepney Borough Council, for being in possession of a large quantity of dried egg albumen, which was intended for the food of man. The albumen was stated to have a most offensive smell, and was being used for the manufacture of nougat.

PROCEEDINGS OF THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

A GENERAL Meeting of the Incorporated 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 13th March, 1908, at 7.30 p.m. *Present:* Drs. Charles Sanders, Alex. Graham, F. E. Cane, Herbert Jones, E. W. Hope, W. H. Symons, S. C. Lawrence, H. Meredith Richards, F. E. Fremantle, Archibald Kidd, J. R. Crookshank, T. P. Puddicombe, P. C. Smith, Wm. Butler, W. McC. Wanklyn, J. A. H. Brincker, J. D. McCrindle, G. F. McCleary, H. Beale Collins and Mr. W. Whitaker, F.R.S.

In the unavoidable absence of the President, owing to illness, Dr. H. MEREDITH RICHARDS was voted to the chair.

MINUTES.

The Minutes of the previous meeting held on 14th February, 1908, having been printed and published in the March number of PUBLIC HEALTH, were taken as read, and were duly signed by the chairman.

The HON. SECRETARY reported that the President, Dr. Reid, was progressing towards complete recovery from his serious illness.

CORRESPONDENCE.

The HON. SECRETARY read letters regretting inability to attend the meeting from Drs. F. Vacher, D. S. Davies, E. Sergeant, and Meredith Young.

ELECTIONS.

The following candidates, having been duly nominated and balloted for, were declared by the Chairman to be duly elected:—

AS FELLOWS.

Clark, R. Veitch, M.A., M.B., BSc., 41, Park Square, Leeds.	M.O.H. for Leeds C.B.
Scrase, F. Edward, F.R.C.S., D.P.H., 6, Woodchurch Road, London, N.W.	(Assist.) Hampstead Met. B. (Deputy).
Hindle, Francis, J., L.R.C.P., Haslingden.	Haslingden, M.B.

AS MEMBER.

Dodd, F. Lawson, M.R.C.P., D.P.H., 41, Wimpole Street, London, W.

NOMINATIONS.

The HON. SECRETARY read a list of nominations.

REFERENCE TO COUNCIL.

On the motion of Dr. F. E. FREMANTLE, it was resolved *nem. con.*, that the Council be asked to consider the desirability of the hall door being left open when meetings are taking place in the Society's rooms.

Dr. E. W. HOPE then read a paper "On Some of the Results of the Re-housing Operations in Liverpool."*

* Published in the present issue.

North-Western Branch.—A meeting of the above Branch was held at the Chemical Club, Victoria Hotel, Manchester, on Friday, February 21st, 1908. *Present:* Dr. A. E. Brindley (President), in the Chair; Drs. Garstang, Wilkinson, Buchan, Wheatley, Greenwood, Beard, Paddock, Buckley, Welsh, Sergeant, Gordon, R. Young, Wheeldon, Harris, Corbin, Thomas, and Barlow.

Letters of apology for absence were read from Drs. Hamilton, Coutts, Berry, Hulbert, Peck.

Minutes of last meeting were read, confirmed and adopted.

Dr. BARLOW presented a report on the meeting of the Council of the Society held in London on January 10th, and further explained that it would be necessary to formally appoint him as representative of the Branch on the Council, which was done on the proposition of Dr. Wheatley, seconded by Dr. Greenwood.

The Hon. Sec. reported that it was the turn of the North-Western Branch to appoint the President of the Parent Society for the coming year.

On the proposition of Dr. Garstang, seconded by Dr. Wilkinson, it was unanimously resolved "that Dr. Sergeant, the Medical Officer of Health for the County of Lancashire, be nominated by the North-Western Branch for the Presidency during the coming year."

Dr. HINDLE, of Haslingden, was elected a Fellow of the Branch.

Dr. W. J. Butcher, Medical Officer of Health for West Houghton, and Dr. Farquharson, Medical Officer of Health for Radcliffe, were nominated for election as Members.

Dr. KNIVETT GORDON then read a Paper on his "Experiments in the Treatment and Prevention of Infection in Enteric Fever," and a discussion followed in which Drs. Wheatley, Greenwood, Buchan, Thomas, Corbin and Brindley took part. On the motion of Dr. Wheatley, seconded by Dr. Greenwood, a hearty vote of thanks was accorded to Dr. Gordon for his paper.

CORRESPONDENCE.

THE RECENT DISCUSSION ON DISINFECTION.

To the Editor of PUBLIC HEALTH.

SIR,—According to the report in the March number of PUBLIC HEALTH, Professor Kenwood's article on disinfection aroused considerable discussion, and it occurred to me that certain American data might not be without interest to your readers. For the past three years we have not, in Providence, been disinfecting for diphtheria, except in a very few cases. During this time isolation has been terminated, without disinfection, in 859 families where diphtheria had been reported. There have been recurrences 15 times, or 1.74 per cent. For the 14 months immediately preceding, during which exactly the same precautionary measures were taken, plus disinfection by spraying formalin, recurrences took place in 1.85 per cent. of 646 infected families. I agree with Professor Kenwood that, perhaps, the exhaustion of susceptible material renders recurrence in the family of doubtful value as a criterion of the success of, or the necessity for, disinfection. But in Providence, during the period mentioned, when there was no disinfection, the disease extended to other families in the house only four times. That the susceptibility of these other families was not exhausted, is shown by the fact that of

773 such families containing persons under twenty-one years of age, only 31 were invaded prior to the termination of the initial case, leaving 742 unattacked and presumably unsusceptible. Moreover, of 186 persons who were removed from the infected families, and brought back after the termination of isolation, none were attacked.

In scarlet fever, recurrences take place in Providence after disinfection, by spraying with formalin, in about 1.26 per cent. of the infected families.

In Baltimore, Stokes and Stubbs report (Reports and Papers of the American Public Health Association, 1906, Vol. XXXII., Part 2, p. 201) that recurrences take place after diphtheria in 1.89 per cent. of the families, and in scarlet fever in 2.10 per cent. In the above, as in Professor Kenwood's article, the figures refer only to recurrences which take place within two months of disinfection, for it seems to me that the few cases which develop after that, are quite likely not to be recurrences. In Baltimore the formaldehyde disinfection is more thorough than in Providence. It is tested in most houses by exposing infected test articles, and the tests prove sterile in from 75 to 80 per cent. of all disinfections.

Yours faithfully,

CHARLES V. CHAPIN,

Superintendent of Health.

City Hall, Providence, March 17, 1908.

To the Editor of PUBLIC HEALTH.

SIR,—Anent the observations upon disinfection made by Professor Kenwood and others at a recent meeting of the Incorporated Society of Medical Officers of Health, I intended to take part in the discussion, but the meeting closed before an opportunity offered, so this letter may be regarded as my contribution to the subject.

Dr. Kenwood remarked that "it would be well in this country if we took a page out of the book of the State of Victoria," but on the other hand, I think it would be ill-advised for us to do so. The intention of those who framed that statute was no doubt good, but the stipulations to which Dr. Kenwood called attention are more or less condemnable, in view of the fact that it has been found impossible to devise a medium of absolutely uniform composition, which shall serve as a universal standard for ascertaining the germicidal powers of various disinfectants, and in view of Dr. Kenwood's further agreement with Dr. Rideal that (as I long since previously insisted) any attempt to produce a single routine bacteriological test that can apply to the very divergent circumstances obtaining in every kind of disinfection, is fore-doomed to failure. How, under these circumstances, is it possible or fair to require at the hands of manufacturers explicit information and directions as to the strength and manner in which their disinfectants must be used on the one hand, or to explain any matter or condition or circumstance (as called for in that statute), in the presence of which the disinfectant or germicidal effect of the substance is counteracted or rendered inoperative or interfered with? Surely, manufacturers do all that can be reasonably required at their hands, either by supplying goods as specified by those who have to use them, or by a simple statement of the strengths under which the substance may be relied upon to do its work, so far as information of a precise character is available. It is, perhaps, fortunate for the general consumers of disinfectants that there are a number of manufacturers having expert scientific knowledge on the subject, but it would appear to be to me the duty of medical officers of health, or others, to provide the information which Dr. Kenwood would appear to demand in his remarks at the hands of the manufacturers.

I take some exception to the experiment made by

Professors Kenwood and Hewlett with pus, upon the ground that pus of such strength as they appear to have experimented with, does not usually require to be disinfected. On the other hand, in common with sewage and refuse organic matter generally, it rather calls for removal, disposal, and, if possible, destruction—not disinfection; disinfection being only demanded in respect of a much smaller quantity of residual pus left in contact with diseased tissues. In all such cases, the major quantity is, or should be, first of all removed by washing operations, so that the remnant quantity is always very much smaller in proportion to the disinfectant employed than they appear to have used in their experiment.

I am further strongly of opinion that these experiments are not to be relied upon as condemning potassium permanganate as a disinfectant agent, and, on the other hand, it would be very easy to point to many important experiments which have demonstrated the very great value of that and other oxidising agents under given conditions; the mere sterilisation of given mixtures under stipulated conditions forming a very small part of the entire subject of practical disinfection.

In common with many others, I take strong exception to the use of dried human faeces in connection with the Lister Institute test, which has met with the approval of Dr. Kenwood, as, apart from the very inconstant composition of that substance, after drying it is no longer in the physical condition of ordinary faeces, for by desiccation it loses its colloid character and becomes a wholly different physical substance, behaving towards chemical reagents (including disinfectants) in an entirely different manner.

With further reference to the standardisation of germicides of the coal tar order, there have been almost endless suggestions concerning the importance of ascertaining the declensions that arise from the association of extraneous organic matter, but I fail to see what is gained by the use of such substances as faeces, gelatine, starch and milk, as contrasted with the employment of nutrient broth in comparison with water. Beef broth and peptone are fairly good and natural instances of organic matter in general, and are, perhaps, better representative of the organic matter with which disease germs are very often associated. In conclusion, I may note that Dr. Klein has used this medium for the purpose of comparing the relative germicidal co-efficients of certain disinfectants, as exhibited under ordinary conditions, and in the presence of organic matter.

I am, Sir,

Yours faithfully,

C. T. KINGZETT, F.I.C., F.C.S.

March 9th, 1908.

ISOLATION HOSPITALS.

To the Editor of PUBLIC HEALTH.

SIR,—In the discussion on Dr. Porter's paper at the last meeting of the Home Counties Branch, some misapprehension arose as to the attitude of certain medical officers of health towards isolation hospitals.

As one who is prepared to accept any instalment of common-sense socialism, I should rejoice to see well-equipped isolation hospitals, with separate rooms, for the isolation of every case of infectious disease occurring in this country. The educative value of a stay in such an institution is of immense value to every patient who has to go through the experience. There many learn for the first time what order, cleanliness, ventilation, and sanitation really mean, and all get some insight into what is necessary to be done when a case of infectious disease occurs in their own families.

When, however, I am asked by my authority whether the establishment of an isolation hospital for isolating a proportion of the cases of scarlet fever that occur, would stop the spread of this infectious disease, I cannot

honestly say more than that by isolating a certain selected few cases from houses where there is over-occupation, or where certain trades are carried on, that the spread of infection will be restricted in those particular instances. As regards other cases, I know that isolation at home, in such a town as Kingston-upon-Thames, is rarely followed by untoward results. The number of secondary cases in home-isolated cases in my town are no greater than the number of return cases of scarlet fever in the hospital-isolated cases. On the whole, too, the cases treated in hospital seem quite as liable to sequelæ as those treated at home. Furthermore, the disease is evidently carried on by the large numbers of abortive cases that are rarely discovered till too late. Dr. Porter's paper showed this very clearly; and I doubt, even were it possible to find them, whether the public would permit the isolation of these doubtful carrier cases in hospital, so that it would appear almost impossible to take the measures which would appear to be necessary to make isolation hospital treatment the successful stamp-out of scarlet fever—it probably would be if every case and every abortive case could be isolated.

Supposing such a success, and scarlet fever stamped out by isolation, should we not be liable from time to time, through world-wide intercourse, to the re-introduction of the scarlet fever poison, and should we not then be the victims of fulminating epidemics, and in worse plight than before?

In short, is not the wide-spread mild form of scarlet fever a preventive against the severer form of the disease of a couple of generations ago. I am inclined to believe that the elementary school and compulsory education are acting to scarlet fever, much as the public vaccinator has acted towards small-pox. We are getting a very mild form of disease as a preventative against the terrible scourge some of us can remember.

Yours faithfully,

H. BEALE COLLINS.

Municipal Offices, Kingston-on-Thames,
March 16th, 1908.

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.

Report on the Origin and Spread of the Epidemic of Typhoid Fever in the Burgh of Peterhead in 1907, by Professor Matthew Hay. Monthly Bulletin of the State Board of Health of Massachusetts. Health Report for the City of Aberdeen, by Professor Matthew Hay, M.D. Health Report for the City of Westminster, by Dr. Francis J. Allan. Registrar-General's Weekly Returns. Health Report of the Ashton-in-Makerfield U.D., by Dr. Nathan Hannah. Report on Plague in Calcutta, by Dr. W. C. Hossack. Annual Report of St. Annes-on-the-Sea U.D., by Dr. Frederick Booth. Special Report on Municipal Slaughter-houses, presented to the Health Committee of the Portsmouth Urban Sanitary Authority, by Dr. A. Mearns Fraser. Minutes of the Metropolitan Asylums Board. Annual Health Report of the Reigate R.D., by Dr. A. E. Porter. Report to the L.G.B. on the General Sanitary Circumstances and Administration of the Sutton Bridge U.D., by Dr. S. Monckton Copeman. Special Report on the Glossop Death Rate for 1906, by Dr. Duncan J. Mackenzie. Annual Health Report for the Glossop-Dale R.D., by Dr. D. J. Mackenzie. Annual Report of the M.O.H. and the Sanitary Inspector for the year 1907 on the Glossop U.D. Annual Health Report of the Guildford R.D., by Dr. R. W. C. Pierce. Annual Health Report for the

County Borough of Burton-upon-Trent, by Dr. James M. Cowie. Health Report of the County Borough of West Bromwich, by Dr. Herbert Manley. Health Annual Health Report of the Coseley U.D., by Dr. W. M. Clendinnen. Annual Health Report for 1907 of the Sanitary Condition of the Urban and Rural Sanitary Districts of Taunton, by Dr. Henry J. Alford. Health Report for the Royal Borough of Kensington, by Dr. T. Orme Dudfield. Annual Health Report of the Woking U.D., by Dr. R. W. C. Pierce. Annual Health Report of the Bilston U.D., by Dr. T. Ridley Bailey. Annual Health Report for 1907 of the Borough of Keighley, by Dr. Wm. Scatterty. Health Report of the Horncastle U.D., by Dr. Robert McLay. Annual Health Report of the Royal Burgh of Rothesay for 1907, by Dr. Andrew J. Hall. Annual Health Report for the County of Durham for 1906, by Dr. T. Eustace Hill. Annual Health Report for Barnes U.D. for 1907, by Dr. F. G. Crookshank.

Journals.

Municipal Journal. Sanitary Record. Hospital. Annali d'Igiene Sperimentale. Annales de Physiothérapie. Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege. La Technique Sanitaire. Australian Medical Gazette. Journal of Balneology and Climatology. Proceedings of the Royal Society of Medicine. Journal of Royal Sanitary Institute. Sanitary Journal. Glasgow Medical Journal. Medical Temperance Review. Journal of Royal Army Medical Corps. American Journal of the Medical Sciences. Journal of Royal Institute of Public Health. Medical Review of Reviews. Experiment Station Record. Giornale della Reale Società Italiana d'Igiene. British Medical Journal. Lancet. Birmingham Medical Review. Water. Journal of Tropical Medicine and Hygiene. Transvaal Medical Journal.

Pamphlets.

Die Krankheiten der Spiegelbeleger von Dr. Th. Weyl, Charlottenburg. Die Krankheiten der Gummiarbeiter von Dr. Th. Weyl, Charlottenburg. Die Krankheiten der Petroleumarbeiter von Dr. Th. Weyl, Charlottenburg. Die Krankheiten der Chemischen Arbeiter von Dr. Th. Weyl, Charlottenburg. Trade-Milk and its Treatment, by C. Budde, D.Sc., Copenhagen.

Child Life and Labour.

By Margaret Alden, M.D. Headley Bros., London. 1s. net.

Catalogue of the Library of the Royal Statistical Society.

A Simple Method of Water Analysis.

By John C. Thresh, M.D. J. and A. Churchill.

Diets in Tuberculosis.

By Drs. N. D. Bardswell and J. E. Chapman. Henry Froude and Hodder and Stoughton. 6s. net.

The Irony of Marriage.

By Basil Tozer. Rebman Ltd., London. Price 1s.

Presentation Copies.

Dr. E. W. Hope, Medical Officer of Health for Liverpool, has kindly presented the following books to the Library:—Handbook compiled for the (Liverpool) Congress of the Royal Institute of Public Health. A Descriptive Account of the City of Liverpool, Fazakerley. Small-pox and Small-pox Hospitals at Liverpool, 1902-3, and Isolation of Small-pox in Germany, 1904. Liverpool Annual Health Reports for 1895, 1896, 1897, 1898, 1902, 1903, and 1905.

LAW REPORTS.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

December 6th, 7th, 20th, 1907.

BEFORE CHANNELL, J.

WILSON'S MUSIC AND GENERAL PRINTING COMPANY v. FINSBURY BOROUGH COUNCIL.

Metropolis Management Act, 1855. Section 250—Public Health (London) Act, 1891. Section 3—Drain or Sewer—Nuisance—Compliance with notice under protest—Right to recover.

Where a system of combined drainage has public sewage taken into it, by a person not the owner of the system, the chain from the point of junction of the new pipe becomes a sewer repairable by the sanitary authority.

When the sanitary authority serve a notice under the Public Health (London) Act, 1891, Section 3, to repair such a system, and the owner of the premises protests that it is the duty of the sanitary authority to do the work, and he does it under protest, he is entitled to recover the cost from the sanitary authority, and also damages for their neglect to do the work from the date when they had notice of the defect.

This was an action to recover damages for injury caused to the plaintiffs' premises owing to the neglect of the defendants to repair an alleged public sewer which took the drainage of the said premises, and to recover the expenses of repairing the said alleged sewer, which expenses the plaintiffs alleged were incurred by them under compulsion of the defendants.

The defence was that the pipe was a combined drain within the meaning of Section 250 of the Metropolis Management Act, 1855, and that the work was done in compliance with "intimation notices" under Public Health (London) Act, 1891, Section 3, and was not done under compulsion, but voluntarily.

It appeared that the defendants' premises were on two occasions flooded with sewage, and that they gave notice to the sanitary authority, who therefore served them in each case with "intimation notices." The plaintiffs denied their liability in both cases, and did the work on both occasions under protest and without prejudice as to their liability.

Dankwerts, K.C., and Oliver appeared for the plaintiffs. MacMorran, K.C., and Courthope-Munroe for the defendants.

CHANNELL, J., in the course of his judgment, said that the pipe was originally a combined drainage system. It was joined at the corner of the plaintiffs' premises by a pipe conveying drainage from a public court, and according to decided cases the pipe was a sewer from that point. The authority could not shew that the junction had been made by the plaintiffs or by their predecessors in title. The plaintiffs were, therefore, entitled to say that the defendants should repair this sewer. On the question of damages he thought the plaintiffs were entitled to recover for the injury they had received from the sewer not

having been promptly cleared when notice of it was given to the public authority. The greater part of the damages was, however, doing the work. He thought the local authority were clearly liable to pay for it. After discussing the various decisions, he said this case could be distinguished from previous cases, because, here the work was, in fact, done under protest. Whatever doubt there may be, and there still is some doubt, as to what the position of things is, when a person who is threatened under these intimation notices acquiesces without protest, and does the work—when it is possible to say that he does it merely as a volunteer; but when he does it with protest, and says, "When I have done it I shall claim to have it paid for by you," then if it turns out that the local authority were in the wrong, and that they were the people who ought to have done the work, he thought that the man who does the work under those circumstances could recover the money back.

Judgment was therefore entered for the plaintiffs on both heads of damage.

[For full report see 72 J. P. 37.]

December 17th, 1907.

BEFORE CHANNELL, BRAY, & SUTTON, JJ.

BROMLEY BOROUGH COUNCIL v. CHESHIRE.

Public Health Act, 1875. Section 41.—Public Health Acts (Amendment) Act, 1890. Section 19. Single private drain.—Work done by local authority on default of owner.—Right to recover.—Compliance with Act.

Where two or more houses are drained by a single private drain, and a defect is discovered in one house, the owners of both may be called on to relay the drain, and on default the authority may enter and do the work without serving the twenty-four hours notice required by Section 41 of the Public Health Act, 1875.

This was a case stated by a court of summary jurisdiction sitting at Bromley, Kent, on the hearing of a complaint to recover an apportioned sum spent in remedying a nuisance in connection with a drain at No. 4, Tweedy Road.

It appeared that two adjoining houses, Nos. 2 & 4, Tweedy Road, were drained together by a single private drain. In consequence of complaints of the occupier of No. 2, a defect was discovered. Notice was served on the owners of both to relay the drains. The owners made default, and the local authority did the work, and apportioned the amount among the owners. The defence set up was that the local authority had no right to enter and inspect or examine the drain or do the work without giving twenty-four hours' notice to the occupier under Section 41 of the Public Health Act, 1875, and that this had not been done. The justices decided in favour of the owner.

Morton-Smith appeared for the appellants, but no one appeared for the respondent.

CHANNELL, J., said that the question was whether the notice required by Section 41 of the Public Health Act, 1875, had to be given simply for the purpose of enabling the surveyor to enter, so as to prevent his entry being a tres-

pass, or whether it was a part of the proceedings to enable persons who might ultimately be liable to come and see the result of opening the drain. It could not be the latter, because it had to be given to the occupier and not the owner. The point could not have arisen until single private drains were brought into existence by the Public Health Acts (Amendment) Act, 1890. He thought that the giving of the notice to the occupier was not a condition precedent to recovering the expenses from the owner, and that the appeal should be allowed.

Bray and Sutton, JJ., concurred.
[For full report see 72 J. P. 34.]

Jan. 13th and 28th, 1908.

BEFORE LAWRENCE J., AND A COMMON JURY.
FERGUSSON v. MALVERN URBAN DISTRICT COUNCIL.
Nuisance—Escape of Sewage—Pollution of Water
—Outbreak of Typhoid Fever—Alleged Contributory Negligence.

This action, which lasted eleven days, was a claim for damages by the owner of a hydropathic establishment at Malvern for losses incurred by reason of the drinking-water of the hydro having been polluted by sewage. It was said that the defendants had negligently allowed the sewage to escape from one of their sewers, and that it had got into the water pipes of the defendant. The defences raised were denial of the negligence, that it was not the cause of the outbreak, but that the outbreak was caused by the bad sanitation of the establishment. They also said that the water pipes were defective. A defence in law was also raised, namely, that the plaintiff had no cause of action, as he had no property in water which was said to belong to the defendants, and that he had no licence to use it.

The water, which was said to be the cause of the outbreak, came from some unknown source in the hills to a well called the Tudor Well, and from thence it was conveyed in pipes, partly of earthenware, with open joints, and partly of metal, to a tank on the plaintiff's premises. The plaintiff and his predecessors had used this supply for a considerable time without knowing whence or how it came to them. The well was subsequently acquired by the local authority, who had cut off the supply to the hydro, but it had been again connected by someone, and the supply had been used from 1902—1905. In the spring of 1905, nineteen cases of typhoid fever occurred in the establishment. In April, the water was discoloured, and was examined and found to be pure. On May 5th the tank was emptied and the water analysed, and it was then found to be contaminated with sewage. The supply was then cut off, and no more of this water consumed. It was said that the pollution was caused by a defective drain belonging to the defendants, or manhole in the drain, from which the sewage escaped, saturating the surrounding ground and so getting into the water.

The persons who had suffered by reason of the outbreak brought actions against the plaintiff for damages, which had been settled at a cost of nearly £7,000.

The plaintiff (Dr. J. C. Fergusson) gave evidence as above, and was cross-examined as to the various sources of water supply, and as to the state of the drains in the establishment. He said that all the cases were consistent with the contamination of the water supply shortly before May 5th. His son, Dr. J. Fergusson, said that no case occurred in any person who came to the establishment after May 5th. Dr. Sidebottom, superintendent of the infectious diseases hospital at Hythe, said that he had been at the hydro in May and June, 1905. He thought the outbreak was caused by the contamination of the water alone.

Various persons who had stayed at the establishment gave evidence as to the clean state of the house, and that the baths, closets and sinks were in good condition.

Professor W. R. Smith, Principal of the Institute of Public Health, London, said typhoid could only be contracted by a person imbibing the poison through food or drink. It was probably in the water some time before May 5th, as it was nearly impossible to detect it in water. He thought the cause of the outbreak was due to the water supply. If there was any escape of sewer-gas from the house drains, it did not have anything to do with the outbreak, as the cases occurred on the other side of the house from where it was alleged such an escape took place. He disagreed that infection had been imparted with sewer air. He knew that an opinion was held that some of the outbreaks were attributable to sewer air. He did not know that the Local Government reports since 1900 attributed more outbreaks to sewer air or insanitary conditions than to water or milk. He had analysed water to find typhoid bacillus, and had found none. Sewer air, to affect a person injuriously, must be in constant contact with the person breathing it. There was no specific predisposition to typhoid fever, and therefore a person who was subjected to the inhaling of sewer air would not be more predisposed to take typhoid from water than a person inhaling fresh air.

There was a quantity of other evidence of a similar kind.

For the defence, Mr. H. Hillyard said he tested the drains at the hydro by smoke test, not under pressure. The smoke came out at the south-eastern corner, not inside the house. Subsequently he tested it, and it came out at several places inside the house. There was no proper interception between the main sewer and the drains of the house. In cross-examination, he said the soil near the water pipe was heavily charged with sewage, which he thought came from the intercepting chamber. It had been filled with sewage, and the under portion of the lid was dirty. It was five feet deep in the chamber. There was a defect in the old chamber higher up. The pressure caused it to fill the intercepting chamber above, and caused it to overflow, and it permeated twenty feet of soil as far down as the lower chamber.

Mr. W. E. Thorp said the inspection chamber was not defective. If there was mischief it came from old house drains immediately over the water pipe. He thought that the sewage under the

control of the defendants did not affect the water. Various officials gave evidence as to the care that was exercised to keep the intercepting chamber clean.

A number of guests at the hydropathic were called, some of whom had suffered from typhoid. Some of those alleged that there were smells in places.

Dr. J. MacMunn said that typhoid bacillus could find its way into the system from sewers and sewer polluted soil. He thought typhoid fever was contagious. He did not agree that water was the most common mode of conveyance of the bacillus.

Dr. Thresh, medical officer of the Essex County Council, said that the latest German theory was that bad water did not cause typhoid, but he did not agree with that. As a rule, however, bad drainage was the cause. The bacillus of typhoid could not live in water except for a short time. Moisture was necessary for its existence. In his view, there was no question that insanitary dwellings were more likely to produce typhoid. It had recently been discovered that certain persons were typhoid carriers. Thus, a woman at his county asylum was found to have had typhoid some years ago and still carried it about with her.

In cross-examination, he said that the cause of the typhoid might have been the water of the hydro, except in one case. There was much nitrogenous matter in sewage, but never enough to cause ptomaine poisoning. There might, however, be enough sewage matter in water to cause sickness. Some of the suspected cases of typhoid might have been ptomaine poisoning. Typhoid germs had never been found in the air.

McCall, K.C., Macmorran, K.C., and Southall appeared for the plaintiff; Montague Lush, K.C., Montague Shearman, K.C., and McCardie for the defendants.

LAWRENCE, J., after summing up, left the following questions to the jury:—(1) Had the plaintiff any property in the water flowing from the Tudor Well into his tanks? (2) Had the plaintiff any licence from the owners to use the water? (3) Were the defendants guilty of negligence in permitting sewage to escape from their sewer? (4) If yes, was the plaintiff guilty of contributory negligence? (5) Was the escape of sewage from the sewer the cause of the outbreak and the illness, or was the outbreak due to the state of the drainage of the house, or due to both causes? (6) Could the outbreak of illness have been prevented if the plaintiff had acted with reasonable care? (7) What were the damages?

The jury answered the questions as follows:—(1) "No"; (2) "No"; (3) "Yes"; (4) "No"; (5) the escape of sewage was the only cause; (6) "No"; (7) damages £7,500.

The defendants claimed to be entitled to judgment on the question of law, as the plaintiff had no title to the water. Judgment was, however, entered for the plaintiff, a stay of execution being granted, with the view to an appeal on the question of law.

RECENT PUBLIC HEALTH LITERATURE.

Actinomycosis.

WYNN (W. H.). A case of actinomycosis (streptotrichosis) of the lung and liver successfully treated with a vaccine. *Brit. Med. Jour.*, 1908, i, 554.

Bacillus Coli.

DUDGEON (L. S.). Erasmus Wilson lecture on acute and chronic infections of the urinary tract due to the bacillus coli. *Lancet*, 1908, i, 615.

Bacteria.

PEABODY (F. W.) and J. H. PRATT. On the value of malachite green media in differentiating typhoid and colon bacilli, with the description of a new method for isolating typhoid bacilli from faeces. *Boston M. & S. Jour.*, 1908, clviii, 213.

Beri-Beri.

DALEY (F. J.). Report on fifty cases of beri-beri in the reformatory school, Alipur. *Indian Med. Gaz.*, 1908, xliii, 53.—PEARSE (F.). On the identity of beri-beri and epidemic dropsy. *Jour. Trop. Med.*, 1908, xi, 69.

Cancer.

CHEATLE (G. L.). Observations on the incidence and spread of cancer. *Brit. Med. Jour.*, 1908, i, 437.

Climate.

ROBINSON (W. F.). Precautions to be taken in coming South. *New York Med. Jour.*, 1908, lxxxvii, 351.

Diarrhoea.

WOOD (A. J.). The prevention of summer diarrhoea in children. *Intercol. Med. Jour. Australas.*, 1908, xiii, 38.

Disinfection.

CHICK (H.). An investigation of the laws of disinfection. *Twenty-two figures.* *Jour. of Hygiene*, 1908, viii, 92.

Dysentery.

ABE (N.). Ueber die Aetologie der Dysenterie. *Arch. fur Hygiene*, 1908, lxxv, 107.

Hand, Disinfection of.

BECKER (G.). Ueber Händedesinfektion mit Chiroster. *Munch. Med. Wochens.*, 1908, lv, 557.

Hospitals.

ARMSTRONG (S. T.). The need of care for the convalescent from the hospital standpoint. *New York Med. Jour.*, 1908, lxxxvii, 437.

Hygiene.

SEAMAN (L. L.). Some of the triumphs of scientific medicine in peace and war in foreign lands. *New York Med. Jour.*, 1908, lxxxvii, 335.—TAYLER (J. L.). Personal Health Problems; early and late growth. *Med. Press*, 1908, i, 288.

Immunity.

HARVEY (W. F.) and A. MCKENDRICK. Notes on immunity to disease. *Scott. M. & S. Jour.*, 1908, xxii, 197.—LANDSTEINER (K.) and M. REICH. Ueber der Immunisierungsprozess. *Zeit. fur Hygiene*, 1908, lviii, 213.

Inebriety.

SHAW (T. C.). The radical cure: Certification of inebriates. *Lancet*, 1908, i, 620.

Insane.

PETERSON (F.). The after care of the insane. *New York Med. Jour.*, 1908, lxxxvii, 383.

Malaria.

ROSS (R.). The prevention of malaria in British possessions, Egypt, and parts of America. *Jour. Roy. Army Med. Corps*, 1908, x, 263.

Malta Fever.

DIXON (T. S.). A case of Malta (undulant) fever. *Australas. Med. Gaz.*, 1908, xxvii, 23.

Meat.

BEVERIDGE (Maj. W. W. O.) and Capt. H. B. FAWCUS. Experiments with preserved meat. *Jour. Roy. Army Med. Corps*, 1908, x, 315.

Meningitis, Cerebro-spinal.

DOW (W.). The clinical symptoms of the cases of epidemic cerebro-spinal meningitis admitted into Belvidere Fever Hospital, Glasgow, during the recent epidemic, together with a short history of the disease in Scotland. *Lancet*, 1908, i, 768.—STEINER (W. R.) and C. B. INGRAHAM, Jun. Epidemic cerebro-spinal meningitis in Hartford, Connecticut, during 1904-5. *Amer. Jour. Med. Sciences*, 1908, cxxv, 351.

Milk.

DELEPINE (S.). Pathogenic properties of, and amount of dirt contained in, the milk supplied to the town of Manchester during the ten years 1897-1906 inclusive. *Med. Chron.*, 1908, xlvii, 473.—NORTH (C. S.). A method of milk production. *Med. Rec.*, New York, 1908, lxxiii, 263.—REPORT on the milk supply of New York City, with recommendations. *Pediatrics*, 1908, xxv, 110.

Oponins.

BROWN (O. H.). Some modifications of the technic of the opsonic index tests. *Jour. Amer. Med. Assoc.*, 1908, l, 602.—MUCH (H.). Oponinuntersuchungen. *Muench. Med. Wochens.*, 1908, lv, 496.

Pneumococcus.

EYRE (J. W. H.). Erasmus Wilson lecture on the pyrogenetic activities of the pneumococcus. *Lancet*, 1908, i, 539.

Refuse.

CORLETT (J.). Refuse destruction or disposal. *Jour. Roy. Inst. Pub. Health*, 1908, xv, 161.

Sanatoria.

LAWSON (D.). Consumptive sanatoria: Are they worth while? *Glasgow Med. Jour.*, 1908, lxix, 161.

Sanitation.

BROWN (Capt. R. T.). Camp Sanitation. *Jour. Roy. Army Med. Corps*, 1908, x, 226.—GORGAS (Col. W. C.). Sanitation of the canal zone (Panama). *Med. Rec.*, New York, 1908, lxxiii, 259.—JORDAN (E. O.). The problems of sanitation. *Jour. Amer. Med. Assoc.*, 1908, l, 493.

Serum.

BAIL (O.) and E. HOKE. Theorie der serumaktivität. *Arch. fuer Hygiene*, 1908, lxiv, 313.—BUTLER (W. J.). The vaccine treatment of gonorrheal vulvovaginitis in children. *Jour. Amer. Med. Assoc.*, 1908, l, 744.

Sewage Disposal.

CALDWELL (Lieut.-Col. R.). Artificial and natural sewage disposal contrasted. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 142.

Syphilis.

ROSENBERGER (R. C.). The present status of the etiology of syphilis. The spirochæta pallida; its biology and ætiological relation to the disease. *New York Med. Jour.*, 1908, lxxvii, 391.

Toxins.

SCHICK (B.). Kutanreaktion bei Impfung mit Diphtheriatoxin. *Muench. Med. Wochens.*, 1908, lv, 504.

Tuberculosis.

ABRAM (A.). The physical signs of incipient pulmonary tuberculosis. *Med. Rec.*, New York, 1908, lxxiii, 309.—ELY (L. W.) and B. H. WHITBECK. Report of three years' work at the Sea Breeze Hospital for the treatment of surgical tuberculosis in children. *Med. Rec.*, New York, 1908, lxxiii, 383.—DE JONG (A.). Ueber Tuberkelbacillen in der Milch Tuberkulöser Tiere. *Centralb. fur Bakteriolog.*, 1908, xvi (Orig.), 213.—KNOPF (S. A.) and A. J. HUEY. Some notes on the etiology, prophylaxis and therapeutics of laryngeal tuberculosis. *Med. Rec.*, New York, 1908, lxxiii, 297.—YOUNG (R. A.). Clinical remarks on pulmonary tuberculosis in infancy and childhood. *Brit. Med. Jour.*, 1908, i, 545.

Typhoid Fever.

BATES (J. P.). A typical typhoid fever; its part in preventive medicine, and its differential diagnosis from estivo-autumnal malaria. *Jour. Amer. Med. Assoc.*, 1908, l, 585.—DEAN (G.). A typhoid carrier of twenty-nine years' standing. *Brit. Med. Jour.*, 1908, i, 562.

Vaccination.

BRADDÖCK (C. S.). Vaccination in the Far East. *New York Med. Jour.*, 1908, lxxvii, 304.

Water.

DUNCANSON (T.). Some notes on water supplies from catchment areas. *Jour. Roy. Inst. Pub. Health*, 1908, xv, 153.

Yellow Fever.

DE YBARRA (A. M. F.). Yellow fever again in Cuba. *Jour. Trop. Med.*, 1908, xi, 73.

BRAZILIAN COFFEE.—The State of St. Paul, Brazil, produces nearly one-half of the whole of the coffee grown in the world, and yet, so far as Great Britain is concerned, it is practically impossible to find Brazilian coffee on sale at any retail coffee dealer's. The Government of St. Paul call attention to the fact that during 1903, 500,000,000 lbs. of Java and Mocha coffee were sold in the United States, which represents about 450,000,000 lbs. more than the whole annual production of Java. It is also asserted that the total production of coffee in Java would not suffice for Belgium and Holland alone, and that, in nine cases out of ten, when "Mocha" is asked for "Real Brazilian" is supplied.

TUBERCULAR BEEF.—At Stratford, on March 7th, Frederick Macer was summoned for having on premises—namely, a slaughter-house—a carcase of beef for the food of man, which was unfit for that purpose. Edward Macer was summoned as the owner of such premises. Proof was given of the existence of tuberculosis in the meat. It was held that Frederick Mace had committed no offence, as the premises were not his premises, but a licensed slaughter-house. Edward Macer, the owner of the slaughter-house was fined £10 and costs, and the licence of the slaughter-house was revoked.

Public Health

THE JOURNAL OF THE

Incorporated Society of Medical Officers of Health.

No. 3.

MAY, 1908.

VOL. XXI.

THE FUNCTION OF THE DOCTOR IN PUBLIC HEALTH ADMINISTRATION.

IT is now generally acknowledged that the characteristic feature of modern public health administration is the great development of the functions of the pathologist and the physician. When, seventy years ago, Edwin Chadwick began to build up our system of State medicine, the efforts of public health reformers were mainly directed, in the words of Mr. Kipling, to "gettin' clear o' dirtiness, gettin' done with mess." The provision of pure water supplies and the removal of all sorts and conditions of filth were the crying needs of the time, and for this work the engineer was naturally the principal advisory and executive expert. But in the last half of the nineteenth century it became apparent that something more was required for the protection of the public health than the sanitation of surroundings; and with the introduction of the notification of infectious disease, the public provision of isolation hospitals and disinfection, and the application of bacteriology to administrative work, there came an increasing demand for the special skill of the medical man. This demand has been intensified as our administrative methods have expanded to include the control of consumption and the industrial diseases, the prevention of infantile mortality, the supervision of midwives, and the work of school hygiene. It would be difficult to name any branch of the science and art of medicine that has not now been included within the scope of British public health administration.

The same tendency that has characterised the general movement of public health reform may be perceived in that branch which is more immediately concerned with the promotion of the public health through the school. The sanitation of school buildings and the prevention of school outbreaks of infectious disease no longer represent all that is required

of the school doctor, who is now expected to acquaint himself with the chief physical and mental peculiarities of the children committed to his charge, and to consider those peculiarities in relation to the education the children receive. The Education (Administrative Provisions) Act, 1907, not only brought the doctor into the school; it brought him also into intimate personal relation with the school children, and it is difficult to exaggerate the importance of this great development of public health work. Universal compulsory education has introduced a new set of conditions which profoundly affect the health of what is in many respects the most important section of the community, and it is the business of the school doctor so to apply his physiology and pathology that these conditions shall promote and not impair the physical efficiency of the nation. This work involves the consideration of educational methods in the light of modern physiology, and in the valuable paper by Dr. C. J. Thomas that appears in the present number of this journal, we may see how important are the duties that devolve upon the school doctor in his capacity as educational advisor.

Dr. Thomas' paper illustrates also what is one of the most distinctive features of the function of the physician in public health work, namely, the application of general principles to individual personal differences. The public health engineer who designs a vast system of water supply or sewerage, works in communities; upon the physician devolves the more difficult task of working in individuals. In school hygiene, in the prevention of infantile mortality, and in other modern developments of State medicine, the most effective work is that which is individualised, and the consideration of the individual human unit will become a matter of increasing importance in our system of public health administration, with the increase and development in that system of the work of the physician.

THE APHASIAS OF CHILDHOOD AND EDUCATIONAL HYGIENE.

By C. J. THOMAS, M.B., B.Sc., D.P.H.

Assistant Medical Officer to the Education Department of the London County Council.

It is within the memory of many who are living that our first real knowledge of the functions of the brain in connection with speech was achieved. It was in 1861 that Broca discovered that the production of speech was dependent upon the health and integrity of a small portion of the brain upon the left side in normal, i.e., right-handed, people. Since that time much advance has been made by scientific observation. Thus, Wernicke, in 1874, discovered that cases in which, while intelligence remained unimpaired, yet the ability was lost to understand language heard, depended upon another special centre in the brain; a little later Kussmaul found that cases in which, while intelligence and the power to understand language heard was retained, yet the power to understand words seen was lost depended upon still another centre. In this way definite knowledge of the relation of the brain to speech has been wrested, and this knowledge ought to be at the service of those engaged in teaching the young. Many new ideas and fads are from time to time sprung upon us and are sometimes taken up with enthusiasm by those who have found the ordinary empiric methods unsatisfactory, only to turn out to be disappointing. To teachers, scientific criteria by which to judge of them should be of considerable value. Short cuts in education are very attractive to teachers, but it often happens in this, as in many other things, that the longer way round is the nearer way home.

In normal educated individuals it is found that there are four speech centres confined to definite areas on the cortex of the brain upon one side only—in right-handed persons to the left side, and in left-handed persons to the right side.

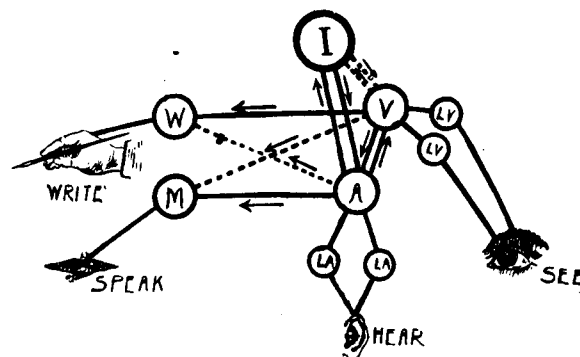


DIAGRAM 1.—CENTRES OF NORMAL SPEECH.

(After Byron Bramwell.)

(A) Auditory word centre. (V) Visual word centre. (M) Motor speech centre. (W) Writing centre. (I) The group of memories associated with any particular word revived and forming the idea which the word represents. (LA) (LA) Lower hearing centres. (LV) (LV) Lower visual centres.

These centres are shewn in diagram 1. They are (1) the auditory word centre (A), upon the integrity of which depends the recognition of the meaning of words heard; (2) the motor speech centre (M) which is controlled by the first, and upon which depends the memory of how to produce words in speaking; (3) the visual speech centre (V) by the activity of which are recognised words seen and nerve currents set in train which awake the sound memories in the auditory centre, and so enable one to understand written or printed matter; and (4), the writing centre (W) wherein are stored the memories of how to produce words in writing. This last centre is directed and controlled by the visual word centre, just as the motor speech centre is controlled by the auditory centre. The lines in the diagram represent the channels of flow of nerve currents, and the dotted lines represent unusual channels of connection which sometimes exist between the centres. Now perhaps it would be best to take the centres in turn and learn a little more about each in detail.

The Auditory Word Centre: This is the most important and normally the primary speech centre, and in most people it remains the dominant centre throughout life, so that, in every operation of the mind involving the use of words or the revival of memories of speech symbols, this centre springs into activity. Words are the symbols of ideas, and all the memories surrounding and composing an idea of something come into relationship with the particular word symbol standing for the idea through the auditory word centre; this relation is shewn in the diagram by the connections of the circle (I); but it must be clearly remembered that there is no justification for the belief in a localised centre for apperception or ideation in the sense that there are lower speech centres; it is represented thus in the diagram for simplicity's sake; it must be looked upon simply as a conventional representation of the whole of the memories and associations which are connected for the time being with the particular word symbol revived in the auditory centre. In the developing child the auditory speech centre is being actively established during the period from six months to eighteen months, and more actively in the latter half of this period. Recurrent sensations are associated with the recurrence of single words or phrases; the child sees a round coloured object and hears his mother say it is an orange; this occurs over

and over again, so that the word comes to mean to the child the revival of memories of the fruit; the fruit, in the same way, revives the memory of the word orange; the sight of the orange is re-inforced by sensations of feeling it, of smelling it, of tasting it; the child sets its teeth in the peel and the acrid sensation resulting also enters into the complex; all these memories form the child's idea of an orange, and any one of them may revive the word standing for it. In this way the connection between (A) and (I) are formed.

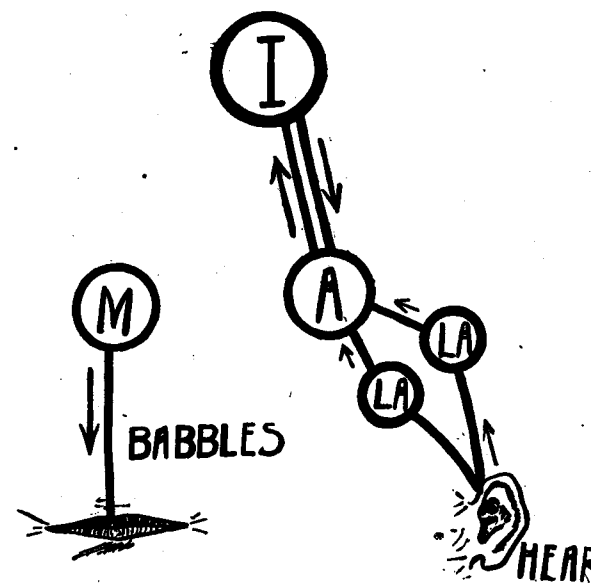


DIAGRAM 2.—SPEECH CENTRES IN FIFTEEN-MONTH-OLD CHILD.

Diagram 2 shews the condition of the child's speech centres at this stage. I have under close observation at present a child of fourteen months who has not yet acquired the power of articulating a single word, yet there is evidence of very complete organisation of the auditory word centre; it is the practice of his elder brother to take the previous day's leaf from the calendar every morning when the family is assembled for breakfast. This has developed into a ritual which must never be omitted; it is termed "taking off the date." One day their nurse asked at dinner time if the elder boy would like some dates for dessert; immediately the fourteen months' old boy rushed to the calendar and stood demonstrating in pantomime below. Now we can understand how in most people the auditory centre remains the one in most intimate relation throughout life to the ideas for which words stand as symbols—why silent thought is accompanied by faint revivals of the sounds of words, and why in expressive language the auditory word centre first takes the lead.

The Motor Speech Centre.—Up to the age of eighteen months or so, there is no connection between the auditory and the motor speech centre; but the cells in the latter practise themselves and make ready for their organisation by spontaneous activity; the child babbles continually, exercising the elements preparatory to their being organised by the auditory word centre; after eighteen months, as a rule, and very quickly once the process is started, connections are made between the auditory and the motor speech centre, and the child begins to utter the words whose meaning he already understands; thenceforward the auditory remains the driving and controlling centre and the path in spontaneous speech is that given in diagram 3.

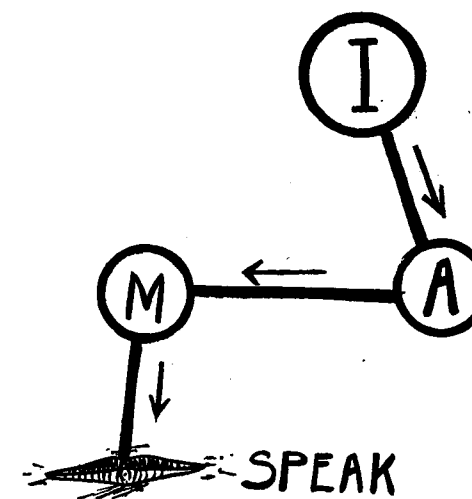


DIAGRAM 3.—SPONTANEOUS SPEECH.

These two centres are termed the primary speech couple. The motor speech centre, however, is not to be looked upon as a purely motor centre, but is a centre of memories of muscular sensations and is a sensory centre just as much as is the auditory centre. Under special circumstances, such "kinæsthetic" centres can enter into more intimate relationships with the intelligence, and may occupy an altogether exceptional position. All must have met with examples of people who are unable to read with understanding, unless they make the lips go through the motions of pronouncing the words. In the cases of Laura Bridgman and Helen Keller, who, although blind and deaf, yet obtained a great command of language, such muscle or kinæsthetic memories must be of the first importance. In certain cases the motor speech centre can be driven by visual centres, and this is how the development of speech in the deaf is possible. In

give it as illustrating the fact that the visual word centre is a distinct entity, and that words continue to be seen as words, when the part of the general visual centre which is connected with the recognition of letters is abolished.

Congenital Word-blindness.—Now one would expect that, as we have cases of congenital inability to organise the auditory word centre, we ought to have children in whom there is inability to organise the visual word centre, although the other faculties are normal. In fact, it is not difficult to find such cases in our schools, although their existence was until recently quite overlooked. I will give some instances of such cases:—

Arthur S., admitted, aged seven, to special class in 1901. Teacher reports that "he is painstaking and clever at all handiwork, good idea of colour and design, and excellent drawing memory. He has wonderful powers of observation, and excellent reasoning powers, but still has such a 'poor memory' that he cannot remember how to make l, p, y, and g; he is good at description of things, and pictures are a great help." In March, 1904, the following report was written: He reads "It has three birds in it" as "To see best in to"; he mistakes the letters c and s constantly. He quickly and correctly does difficult sums in mental arithmetic, and can describe with great minuteness any scene he has witnessed; his memory is only bad for word symbols; his intellectual processes are carried on entirely in pictures, yet the visual word centre seems wanting. He is a bright and intelligent boy, of great ability in many directions, but all attempts at teaching him to read remain of no avail. In November, 1904, he was again examined; 11,308 was written down in Arabic numerals, and immediately the boy said "eleven thousand three hundred and eight." Asked to multiply it by fifty-five, he did so easily. He was apparently reading what was upon the board, but on testing him it was found to be a feat of auditory memory; amongst the words on the board were "not," which, when written down separately, he said it stood for "one"; "buds" he read as "branch"; "horse" he could not read (he mistook r for b). All these words he recognised with ease when spelt aloud to him; they were all words he had just had in the lesson. The boy's desire to read is most painful; he is ambitious above the ordinary, yet he is unable to read the smallest words after years of careful teaching. In May, 1905, he is able, with much difficulty, to make out a few three-letter words. This he does by tracing out the letters with his finger, and thus utilising one form of kinæsthetic memory.

Edward D., aged ten. Obedient and affectionate boy, well grown. Has been in special centre two and a half years. Is up to normal standard for age in all but reading. Calculation very good; money sums done mentally, correctly, and with ease. Likes drawing and is good at it. Draws the Union Jack spontaneously. Does not recognise the word

"Jack" when it is shown him, but does immediately it is spelt aloud to him. Is word-blind; mistakes letter R for P, N for M or W. His articulation is good, has attended school regularly since age of three, very intelligent in conversation. Vision = 6/6.

Charles D., aged eight. Brother of previous case; healthy boy, but unusually restless. Is equal to average in all but reading. Recognises most of the letters, but mistakes some capitals; can read no words, and is not so good as his brother in recognising words when spelt out to him.

Lilian C., aged thirteen and a half. Has been at school since age of three, and in special centre five years. Is a capable, trustworthy girl. Acts as mother to a family of younger brothers and sisters. Note made 1903 (July): Visual word centre is inactive and is weakest part of brain, otherwise improving greatly. Does not recognise M or P, cannot read any word. Converses rationally, and is normal in every other respect.

Willie W., aged seven. A bright, obedient boy, who is anxious to please. Has been four years at school under an excellent mistress. Is very good at numbers—above the average. Has a marvellous visual object-memory, and draws well. Recognises a very poor pictorial representation of a fox, but immediately afterwards fails to read "fox." Mistakes a few letters, R for B, W for M, and X for C. Auditory memory is not strong. Vision = 6/6.

E. A., aged nine. A well-developed and well-nourished girl, who appears somewhat dull; there are no degenerative stigmata, and she has had no serious illness. There is some deafness present, a whisper being unheard at six feet. In spite of her hardness of hearing her auditory memory is much better than her visual memory. She does arithmetic readily, recognises Arabic numerals without difficulty, but after five years' constant schooling, has learnt only two or three letters. She recognises the meaning of several words spelled out to her letter by letter. She has "a good ear for music." Vision is normal.

J. H., aged fourteen, has been five years in a special school. In March, 1901, it was noted: "Improving in everything but reading; cannot interpret any word." In November, 1904, no progress has been made in reading, although his attainments in other respects are normal. He does difficult problems in mental arithmetic with ease, drawing is good, and manual subjects excellent. He cannot read the word "cat," although when spelt aloud, he recognises it at once.

A sister, S. H., passed through this school, and her final note states that she could do everything but read on leaving. The mother states that she herself could never learn to read, although she had every opportunity. Five other children in the same family have been unable to learn to read.

The following cases I have seen during the past week.

Ethel S., aged 12, has been to school since the age of three. She is a healthy child, quite intelligent and quite up to the average in all things, except reading and associated subjects. She

invariably obtains full marks in arithmetic and needlework, and she has exceptional ability in singing. She can read very poorly indeed; she arrives at the meaning of a very few words by slowly spelling out; she reads "But how do you know this" as "But now go—know with"; she read "know" and "but" by spelling them out rapidly. Her dictation is invariably marked by her teacher as "shameful" or "rubbish"; it is a medley of graphic gibberish; yet she can read off and manipulate numerals with consummate ease; dictated one hundred and forty-three thousand three hundred and eight, she writes down the figures correctly without hesitation, but she cannot even write the word "one." She can transcribe slowly but fairly correctly; she can draw fairly well and drew for me her idea of a house, in which it is interesting to note that she put in the figures 86 above the knocker on the door. One more interesting fact is that, although she can read several letters and Arabic numerals especially with ease, she is, in addition to being word-blind, unable to read musical notes; both these two faculties being associated in normal people with special visual centres in direct relation with corresponding auditory centres.

Another case seen during the past week is Thomas A., aged 12, in a special school. At eight years of age he is described as being a healthy lad, well pleased with himself, and with the idea of coming to a special school. Nutrition good. Head 19 inches in circumference; palate normal, slow response, pose nervous. On December 19, 1904, he is noted by me as being of prognathous type with much fibrillary twitching of muscles. Muscular memories good; visual memory reinforced by motor; auditory memory very poor. Writes name readily; spells it out with difficulty. In January, 1906—Vision = 6/9. Has improved generally; still reinforces visual by muscular memories, tracing out letters with his finger. March 8th, 1908.—Aged thirteen. Now adolescent, but still nervous. Still traces out letters with tip of finger; no reading of words otherwise; is a smart boy generally; already partially earns his living by selling papers, and with lightning rapidity calculates the margin of profit upon any number of half-penny papers. Can read and manipulate numerals readily.

This last case is interesting as shewing how reading may be accomplished in some of these cases who are of the motor type by kinæsthetic memories (compare Bastian's case above). His dictation is peculiar, he drives, like Bastian's case, his writing centre by the auditory, and we have the curious errors which motor types of memory often give of transposition of letters in words "was" for "saw," "rams" for "arms."

These cases of congenital word-blindness are of very common occurrence, although until recently unknown. During the past week alone I must have seen in my ordinary duties over a dozen cases. Out of thirty cases

examined in a centre for elder mentally defective boys I found that four were cases of pure word-blindness only.

Out of eighteen cases in an ordinary mentally defective centre two boys and one girl were noted as being word-blind. Another girl (Ethel S.) described above was seen in an ordinary school.

How comes it that they have not been noticed before? The few cases described have been recorded by ophthalmic surgeons; the first was described by Dr. Pringle Morgan in 1896. In 1900 Hinshelwood described one or two such cases, and since then cases have been described by Hinshelwood, Nettleship, and Sidney Stephenson; these were all in boys whose parents were anxious about their education and their future, and so consulted surgeons as to whether visual defect had anything to do with their condition.

But the great frequency of the condition has only been brought to light by the association of school doctors with teachers in the schools, and illustrates the importance of this association and the benefit which is likely to accrue in the future from the application of physiology and medical science to educational problems. I have calculated that one in every thousand of the children in our elementary schools at least shew this defect.

A very interesting point is the ease with which these children understand and use Arabic numerals, and this is an important diagnostic point of the condition; it will be recollected that in acquired cases the same phenomenon occurs.

The condition is much more frequent in boys, and some English observers have described it as only occurring in boys, but I have seen it very frequently in girls, although I think I am the only observer who in this country has put on record such cases amongst girls.

Although the visual word centre is incapable of organisation, yet it often happens that these children are strong visuals in memory type. In the case of Arthur S. I found that all his memories were visual rather than verbal; for instance, I made him repeat several times after me "the road is almost like a stream" until I thought he must be word-perfect. After the lapse of fifteen minutes I asked him to repeat to me again the phrase he had learnt. He replied: "the road is almost like a river"; shewing that he had translated and fixed in memory

the phrase as a visual picture and not as words, and re-translated it into words when it was again required.

The condition of congenital word-blindness is much commoner than word-deafness; it is quite clear that the latter is of greater importance in the struggle for existence; but word-blindness seems to be commoner in the lower grades of society than in the upper; this you might expect. I have shewn the marked hereditary nature of the condition. It is clear that, although it does not affect the chances of life, it does affect the chances of rising in the social scale; the function of reading is, as Byron Bramwell has termed it, a "speech luxury." We would expect, therefore, an accumulation of cases in the lower ranks. The treatment of word-blindness has been indicated; it is to aid the understanding of visual symbols by use of other memory centres, and especially, if possible, by kinæsthetic centres; e.g., reading with the tip of the finger as in the case of Thomas A.

There are other memory centres which shew variations in capacity for organisation, and which are frequently found wanting in children; for instance, musical memories are associated with a special centre in the auditory region quite distinct from the word centre; musical memories may be alone obliterated from the memory by disease; and we find the capacity congenitally varying from those in whom there is very great capacity for organisation (in the musical prodigies which are constantly being discovered) down to complete absence in the tone deaf children, who are much more frequent still. A similar condition exists for colour, from those of great artistic appreciation down to those who are colour blind.

I should like to devote the remainder of my lecture to the application of cerebral physiology to pedagogical methods.

Dictation.—Teachers often complain of the irksomeness of the task of correction; but armed with a knowledge of speech centres his mistakes teach one much about the mental constitution of a pupil, and the correction becomes a positively entrancing occupation. In dictation three of the word centres must be revived in order, namely the auditory, then

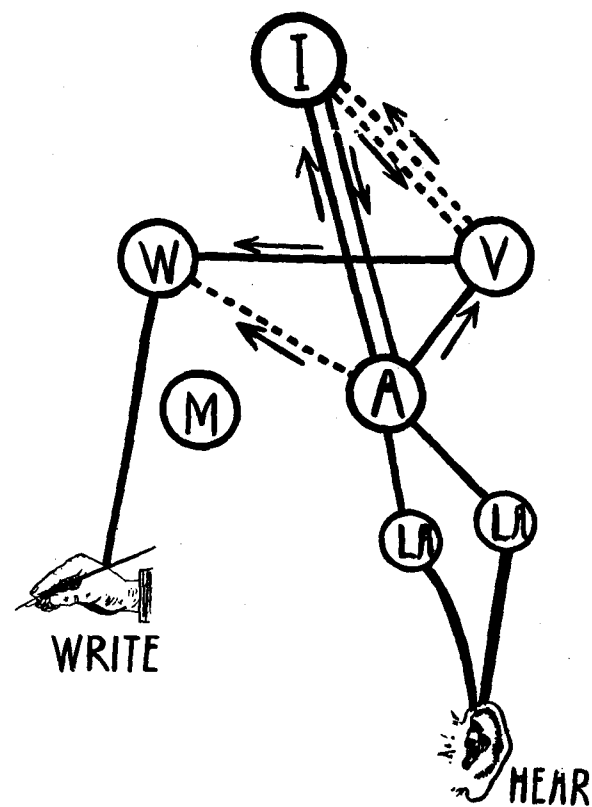


DIAGRAM 7.—DICTATION.

the visual, and finally the writing centre. Mistakes arising in any one centre have definite types. Here are four papers taken from a single class during the past week:—

1. Thomas A. That morning he "was" a "womman what" a cat in her "rams." He asked her if she "wold sel" him the "anile."
2. Robert C. That "mornong" he saw a "women" with a cat in her "ares"; he "arket" her if she would sell him the "amelem."
3. Percy T. That morning he saw a woman with a cat in her arms. He "arsked" her if she "wood sel" him the "amimal."
4. William W. That "moring" he "swo" a "wnoyes" with a cat in "haer sheer." He "sis" her if she "worlt sels" him the "nulen."

No. 1 I have already dealt with; it gives the type of *transposition* which is found in strong motors.

No. 2 is from a boy who could read very well, and shows *substitution* of similar letters—a form of paragraphism due to weakness in the connection between visual and writing centres; the word "asked" is spelt as "arket," "arms" as "ares."

No. 3 is of a dominant auditory type; he writes "would" as "wood," "asked" as

"arsked," the badly educated auditory centre betraying itself in the latter word.

No. 4 is a word-blind boy, extremely self-reliant, capable and normal in other respects; he writes graphic gibberish—"wnoyes" for "women," "haer sheer" for "her arms," etc.

Ambidexterity.—A fad which is constantly being revived is that of the importance of ambidexterity. The knowledge that the speech centres and speech activity are confined to one side of the brain, and that unidexterity is closely related to this, shows that the latter is connected with a high state of intelligence. The physiological dictum is distinctly against this fad, carried to such lengths as to demand that each side should be equally ready, and that writing should be done alternately with the right and left hands.

What should be done with a left-handed child? Our knowledge of cerebral organization suggests that, by the time the child has reached school age, the auditory word centre and the motor speech centre are already fixed upon the right side, and to attempt to controvert this condition would be a mistake.

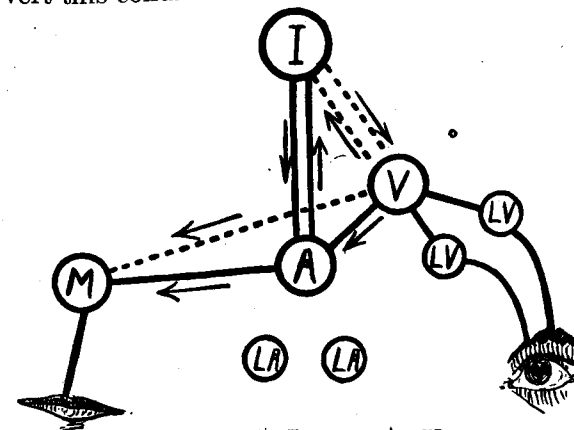


DIAGRAM 8.—READING ALOUD.

Finally, I should like to make some remarks upon *learning to read*. There are several methods in vogue of teaching children to read. They may be divided into the visually analytic and the visually synthetic. From our knowledge of the physiology of the word centres, we must have gathered that the essential business in learning to read, is the formation of a visual word centre, wherein the word is seen as a whole and not as composed of letters, and thus at once enters into relationship with auditory word symbols or ideas already present. But most of the systems in vogue ignore this entirely, following the visually analytic method of breaking up words into letters and re-combining them into words in motor or auditory centres, and leaving the development of the visual word centre entirely to chance.

The reason of this is partly ignorance of the nature of mental operations in reading or partially the altogether laudable desire to follow the principle in education which enjoins the stimulus and development of the child's own self activity, and to give the child the means of arriving at the interpretation of visual symbols unaided.

In the older methods the letters were first learnt with great pains; they appear to be learnt by the young child as muscle memories to a great extent, and familiarity with the form of the letter is gained much more quickly by the child if he makes the letters with straight and curved strips of wood, handles and nurses great carvings of them, and traces them out in sand with the finger. This explains why children so often mistake for one another p, b, q, and d; also m and n, and n and u; M and W and N and Z; each of these groups require identical muscular actions to produce the letters. Again, at the beginning, children shew the transpositions which are characteristic of motor types (and which we saw in Thomas A's dictation); they read "was" as "saw"; "on" as "no"; "dog" as "god," etc.

When the letters are known, then word-building is commenced; the letters are put together in small combinations at first, and these are learnt by rote, i.e., by the auditory memory; AN is "an" the child is told, PAN is "pan"; AT is "at," therefore, since P made AN into PAN, it makes AT into PAT; the intelligent child is able to make this induction for himself; so we get a visual analysis and an auditory synthesis. If letters are combined together so soon as two or three are known, they are remembered more quickly because they come to mean something, whereas the letters themselves can have no possible meaning to a child, and the whole twenty-six form a large order to be learnt as meaningless symbols.

That is a type of the older methods, rather cumbersome, and in so far as it does not take into account consciously the development of the visual word centre or visual synthesis, it is unphysiological. Yet it stimulates the self-activity and deductive powers of the child, and a great merit is that by its means natural auditives learn to spell correctly. A newer visually analytic method is the

Phonic System, which has been worked out with great elaboration and is at present the fashionable system in our schools. It consists in paying attention to each letter and associ-

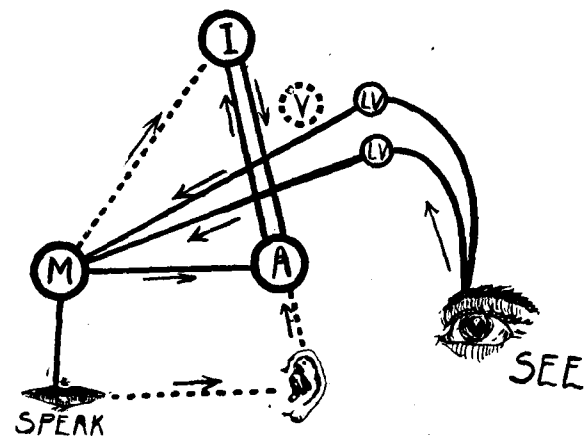


DIAGRAM 9.—THE PHONIC SYSTEM OF READING.

ating the sight of it with the most usual sound for which the letter stands, so that the appearance of the letter is connected straight away with the production of the sound and by producing the sound of one letter after another rapidly presented to the eye, the word is pronounced, the first synthesis taking place in the motor speech centre. (The names of the letters are rigorously excluded by the devotees of this system, and it is pathetic to hear the teachers bemoaning the fact that in spite of their efforts, the wayward children *will* pick up names of letters from other children attending neighbouring unenlightened schools.)

There are several objections to this system, although it has some remarkable features. Its popularity with teachers arises from the fact that it is extraordinarily rapid; this is so because the child is able to read aloud without any invocation of intermediate centres, getting straight from lower visual centres to motor speech (compare Echolalia). This is not to the physiologist a valid merit. Another merit is that the child can pronounce new words by its own unaided activity; another that great attention is paid to sounds and their enunciation, and this is an extremely valuable feature. It is, furthermore, interesting to the child and tends to develop intelligence.

Carried out to the fanatical extent that it sometimes is, however, there are very serious objections.

1. It forms its first synthesis in a motor or kinæsthetic centre, which in general is a weak and vague centre, and in this way, although it undoubtedly leads to facility in reading aloud, it tends to reading without understanding; it does not develop silent reading, which should be the chief aim in any system of teaching to read.

2. Involving at first the exclusion of all irregular words, a very large number of words in the child's vocabulary are for long ignored, and it necessitates special and artificial reading books.

3. Difficulties arise when later irregular words are met with, and these form a very large proportion of our English words.

4. It does not teach auditives or visuals to spell, and this is one of the complaints which we frequently get from teachers who receive the children later.

5. It does not attempt to develop a visual word centre, and the essential point in teaching to read is ignored. The child has to do this for himself in opposition to the system.

As a hidebound system, the phonic method is therefore not to be encouraged, although many of its features should be incorporated in the ideal system. For some word-blind children it offers perhaps an excellent method.

The visually synthetic type of teaching reading is that called the "Look and Say" method; the child is not taught to analyse the word into letters but to connect the visual word symbol as a whole with the auditory image which is already there.

The child learns to read as it learnt to understand, by association directly of symbols of ideas with the ideas for which they stand. If it is true that those highly cultured natives of the East, the Japanese and Chinese, have a separate symbol for each word, then it is clear that the "Look and Say" method is the only one open to them.

This method aims at the production straight away of a visual word centre, and is, to that extent, physiological. It is the only system which takes into consideration the real end which all systems should make for. By this system the child's auditory vocabulary is fully utilized, each word in the auditory vocabulary may receive straight away its visual counterpart.

It teaches strong visuals to spell. Its objections are that it does not teach strong auditives to spell, and, more serious, that it does not give the child a means of attack upon unknown words. It makes no use of the fact that words are in English combinations of twenty-six elementary symbols. The child cannot find out what a word means, unless he is told at the time the word is exhibited; though pictures are a help and so is the labelling of all objects in the schoolroom with their names.

It is clear that the best system of teaching reading is one combining all these methods; the education in pronunciation of the phonic system, the auditory spelling of the ordinary analytic system, and the fixing of all words learnt by "look and say" methods must all have a part in the ideal system.

THE COMMUNICABILITY OF PHTHISIS.

By JAMES NIVEN, M.A., M.B.,
Medical Officer of Health, Manchester.

(Continued from page 59).

WE find it recorded in the detailed work of the Commission that anthropoid apes contracted generalised tuberculosis when fed on tubercle bacilli, whether of bovine origin, or derived from the slighter (and presumably human) strain of tubercle bacilli. There is thus no presumption that infectious matter of human origin is less dangerous to man than infectious matter of bovine origin. Hence, assuming that bovine tuberculosis, when transferred to man, becomes gradually modified into a milder human type, the importance of the latter as a source of infection may, and not improbably will, remain unimpaired.

Dr. Bulstrode is severe on Cornet's work on the mortality of Prussian Catholic nursing orders, and Dr. Hamer contributes an able analysis of some of the inferences drawn by Cornet from the facts which he was able to collect. We quite concur in his dissatisfaction with part of this work. It was necessary for a full comprehension of the results, that Cornet should have given the form of inquiry which he sent to the different institutions. Dr. Hamer has proved that the average number of inmates at different age periods in the aggregate of orders, given by Cornet, is unsatisfactory. We are not told whether the daughter institutions were all in existence during the twenty-five years over which the statistics extend, and we suspect that some of the discrepancy between the actual and the calculated populations may have arisen from some such cause. Indeed, Cornet states that, unhappily, in a number of convents it was not found possible to divide the inmates into age groups, though in the majority this subdivision was obtained, and the results are given in Table IV.—one of the tables which Dr. Hamer uses to calculate the populations living at groups of ages. It is thus remarkable that the populations at groups of ages calculated by Hamer from the death rates and deaths in age groups add up approximately to the total average number of inmates given by Cornet. It is to be regretted that Cornet did not supply the average population in age groups for those convents in which he considers that he was able to obtain them. A considerable amount of transference appears to have gone on

from daughter to mother institutions, and we surmise that such persons may have been not infrequently counted twice over. Some of the excess of inmates at ages thirty to forty may have been due to this cause.

The difficulty experienced by Cornet in getting the inmates in age groups is also significant. All this makes it needful that he should have explained how he arrived at his age grouping of populations.

On the other hand, there is no reason to suppose that the difficulties exist as to the fact of death at death, or the duration of stay in the convent up to death. Yet, singularly enough, Cornet states that, on this last point, some difficulty was encountered.

In regard to the cause of death, misgivings must be experienced, and it would seem possible that Cornet may have tabulated as tuberculosis all the causes of death registered as phthisis and bronchitis, since the latter is not otherwise recorded, unless inflammation of the lungs included bronchitis. In any case, great uncertainty must attach to the diagnosis.

Nevertheless, bearing in mind these sources of error, the particulars which remain are very striking. Referring to Table 6 in Cornet's paper, we find that the greatest number of deaths occur in the second year of convent life, not only from "tuberculosis," but from other infectious diseases, and from the remaining causes of death. It is to be remembered that the novices were put to very hard tasks, and such as would expose them especially to infection, including the making of beds, sweeping the floor and so forth. The greatest mortality from tuberculosis is distributed fairly evenly between the second, third and fourth years of stay in the convent, and it is noteworthy that only two deaths from "tuberculosis" occur in the first half-year, though there are sixty-nine in the second half-year. The figures given would seem to indicate that the illnesses designated were contracted for the most part in the convent.

In our earlier experience of phthisis, and accepting our histories of infection, we found that the most common period between the presumed infection and death was between two and three years. These figures agree with those of some authors in Dr. Bulstrode's chapter on this subject. From the Manchester records it was calculated that the average duration of illness in 500 cases was 2.9 years. This computation was made by Mr. Lock. Unfortunately the data here allow of no direct

36
L15 m56, M88
M88.21

69088.

comparison. It will, however, be possible to compile data from our books which may serve for a comparison with the figures given by Cornet.

The other fact to which we would call attention is the frightful mortality ascribed to tuberculosis, amounting to 1,320 deaths, out of a total of 2,099. Allowing for a large margin of error in diagnosis, these figures are very remarkable. It should be added that Cornet examined the dust from rooms occupied by consumptives in seven convents, in which no sufficient precautions were taken with regard to sputum, and found viable tubercle bacilli in five of them. In two others, in which there were a number of consumptives, but careful precautions and strict cleanliness were observed, no viable bacilli were found.

It is much to be regretted that inadequate data have been handled in a manner to call for legitimate and severe criticism, but we do not see that the value of Cornet's mortality facts is thus overthrown or even seriously impaired.

Of quite a different order are the facts collected by ourselves. In the Manchester enquiries the patient's family history is recorded, so far as it is germane, the history of his habitation for a number of years, going well beyond the years prior to the commencement of his illness, a brief account is given of his illness, of his general health prior to the attack, of his habit of body, and of his personal habits in respect of alcohol. His places of occupation and the character of his work are traced for a sufficient number of years. Particulars of the sanitary condition of his present habitation are recorded. These are valuable, of course, chiefly when the disease has been contracted while living there.

The sputum is examined for tubercle bacilli in many instances, and where suspicious illness has occurred in members of his family or intimates, samples of sputum from these are obtained and examined.

The various exposures to infection which he has experienced are enquired into carefully, with most success when the patient himself is the informant. As a rule, we have all necessary information about previous cases in the relatives since 1900, and we can at once ascertain the history of phthisis in the workshops in which he has been occupied. We are very often in a position to say whether the milk supply has been tuberculous, and though this information has only been entered on the

inquiry form in cases giving a history pointing to abdominal infection, it could be recorded systematically. We know the public houses which he frequented prior to infection, and the lodging-houses in which he has perchance lived.

In fact we have gathered an amount of information which enables us to form an estimate as to whether a given prolonged exposure to infection has or has not been a possible source of the illness.

In forming this estimate we take from experience a period of half a year to a year and a half, as the most likely period of latency, and we form the best estimate we can as to the period at which the illness commenced.

This is, in fact, the procedure adopted for other infectious diseases, except that in this case we have to take into account that prolonged exposure is always to be looked for, and, in the case of healthy people, intimate exposure, as well as the very different rate of progress of the disease.

This mode of procedure is to be called one of association, in no other sense than is the connection of cases of enteric fever or scarlet fever with previous cases of the disease. If it be urged that the proved occurrences of latent tuberculosis suggest that a similar phenomenon has occurred where we think we witness infection derived from a known source, one can only say that, taking all known pathological facts into account, in our opinion, this may be rejected as seriously interfering, on the average of the cases, with the ascription of the disease to the traced source.

Doubtless, many individual errors would be made if too positive an attitude were adopted, just as many individual errors are doubtless made in the case of scarlet fever. In the main, however, the connection between the supposed infecting source and the infected person would be sustained.

In the course of the consequent administration, immense improvement has been effected in private houses in respect of expectorating on floors, the care of bedclothes and personal clothing, coughing towards other persons, and general cleanliness. In workshops generally, the habit of expectoration has been immensely reduced, and in common lodging-houses there has been decided improvement; probably also to a less extent in public-houses. One no longer sees expectoration on the floor of the non-smoking tramcars or on the stairs of public buildings.

Is it credible that all this should have failed to produce a beneficial effect on chest disease?

Nor are we nearly at an end of what may be effected. Something has been done to induce phthisical persons to apply earlier for treatment and instruction. But it is here that progress halts at present. I maintain, therefore, now, as from the first, that, in proportion to the expenditure incurred, more may be done under a notification scheme, judiciously managed and fully staffed, than by any other administrative means. But we are still a feeble folk. It would, indeed, be rather much to expect from a small staff, however able, in a population of 650,000 persons, effects comparable to those produced by a general rise of wages.

There is, however, another result of the notification of phthisis, and of the discussions which have occurred in connection with it, viz., the interest which prophylactic measures have aroused amongst medical practitioners. It is probable indeed, that, in the aggregate, the work of the medical practitioner has been in the same direction and more potent than that of the health authority. Naturally this influence must be strongly in evidence in London. The influence of notification, then, cannot be appraised by comparing London with towns in which notification is in force. Moreover, other beneficent sanitary work has been carried on in London on a very large scale, and this also is a factor in the position.

I do not admit that the fruits of our work are not visible. I have hesitated to claim the visible improvement as the result of notification. But it is probable that some part of the recent improvement is the direct outcome of notification. We reserve this matter for further discussion.

These questions have a very important bearing on hospital treatment or other methods of segregation. I am entirely in agreement with Dr. Bulstrode when he maintains that, though we cannot accept segregation in union hospitals in the past, as being the main factor in English progress, segregation in hospital is, under favourable conditions, calculated to limit infection. This position, however, is a virtual acceptance of the theory of personal infection from man to man. If, however, so much be accepted, notification and a consequent administration follows. To render this administration successful, early notification is needful, and this can only be obtained when acceptable assistance is offered, either by way of hospital

treatment or by aid at home, or both, as occasion requires. Under the German insurance laws the workman is made to insure against sickness, aided to some extent by the State. The apparent part taken by the employer may be put aside, except as facilitating the process. If the sanitary authority were authorised to give the aid in these cases under suitable conditions, we should be able to effect much more than we do in the prevention of phthisis, and there would be no loss of economy. The whole of the administration would thus be linked together. On the other hand, it would be a good thing if workmen could be induced to go in for compulsory insurance. Like Dr. Bulstrode, I have been disposed to put stress on the German insurance laws.

The fundamental factor, however, is probably the rapid increase in well-being of the German workman, as it was and is of the English, while the diminution of phthisis, the declining death rate, and the visible changes as regards habitation, show that the increase in wealth is in the main wisely used.

The chief difference, I think, which exists between Dr. Bulstrode, and those who have advocated notification and direct administrative measures concerns the relative importance of the conditioning factors of infection, and of infection itself.

In the course of the preceding observations I have endeavoured to present the facts in such a manner as to show the degree of infectivity of tuberculosis, and the manner in which it is propagated. I have not been able to see that any evidence has been adduced sufficient to shake the conclusions from which one started many years ago, that tuberculosis is eminently a communicable disease, communicated chiefly in adult life from man to man, but also conveyed by food, especially by tuberculous milk and meat, though to a far less extent. Nor does it appear to me that the position originally assumed that infection is most largely carried in dust derived from tuberculous discharges, and more particularly from the expectoration of consumptives, has been materially altered, though, perhaps, the channel of invasion may have to be slightly reconsidered. This, however, is not a very material point. As regards the theory of "droplet" conveyance, we have seen that this method of infection, though not negligible, may yet be regarded as secondary. When this subject was first brought before the North-

Western Branch of the Society of Medical Officers of Health, in 1892, considerable stress was laid also on infection by faeces, especially those of tuberculous children, and I am still disposed to lay stress on this source of infection, though it has not been possible to bring this danger sufficiently under administrative safeguards.

As we have seen, the minimising of the importance of infection implied in the application of the term sub-infectious to tuberculosis, does not appear justifiable. In one section of his report, Dr. Bulstrode deals with the subject of "healed phthisis," as revealed by autopsies, made on persons who have died from other causes than tuberculosis. The proportion of such cases varies in the experience of different observers. But all agree that a considerable proportion of autopsies reveal healed lesions. One cannot have it both ways. A disease which is able to infect so vast a number of persons can scarcely be regarded as sub-infectious. We have endeavoured to show that under favouring conditions, such as poor nutrition, over-crowding, want of light, impaired health and repeated exposure to infection, the number of individuals infected may be very high indeed; and as the history of tuberculosis in cattle would seem to show, it may be doubted how far poor nutrition and impaired health are necessary factors. The following is a very instructive story given by Bang in his paper to the International Veterinary Congress of 1905. A Danish farmer, in a large way, had his herd tested in 1900, at which time there were only a few reactions. Thereafter he separated the calves and had them tested with tuberculin once a year until they were between two and three years old. Those only which were free from tuberculosis on the application of the test were then added to the stock, being placed at one end of a large, lofty and well ventilated cow shed, in which, however, there were still some tuberculous cows. In 1908, Bang induced this farmer to have his herd re-tested, when it was found that as many as 286 reacted, while only twenty-nine failed to react. This example is given by Bang, not in order to show that an erroneous procedure had been followed, but that von Behring was quite wrong in supposing that these animals are infected as calves. Here, in fact, is infection exhibited of adult animals on the largest scale. Nor, if one reflects on the nature of the experience, is it

easy to see how these cows could all have been infected, if infection took place in the cow shed, otherwise than in the same manner as Koch's guinea-pigs were infected—by infectious dust. Nor does this experience stand alone. In herds freed, or apparently freed, from tuberculosis, after clinical examination, and the application of the tuberculin test, it is occasionally found, after an interval not exceeding a year, that a number of cows have become infected, and not merely, as usual, one or two. There appears no reason to regard this as due to defective testing, or as being other than the result of infection derived from some one cow which has developed tuberculosis in such a manner as to lead to the copious discharge of infective matter which has been diffused in the cow shed.

I believe that the infectiousness of tuberculosis, under conditions which are of frequent prevalence, is much underrated. Very great stress must, therefore, be laid on the fact that it has been found possible, dealing only with the infectious aspect of the disease, utterly ignoring the soil, and under hygienic conditions which must have been, sometimes, at any rate, far from favourable, entirely to eradicate tuberculosis from dairy herds. True, the administrative procedures are special. But the fact remains.

But, if the disease is so infectious, under any circumstances, how is it that the staffs of consumption hospitals and sanatoria are so singularly free from it. On page fifty-six of Dr. Bulstrode's report we find: "Ransome expresses the same idea when he says that if the simple contagium theory were true, hospitals for consumption should have been, at any rate in the past, hot-beds of infection; but the universal testimony of physicians to these institutions is that no conveyance of the disease can be traced to any such institution even before the practice of disinfecting the sputum had been carried out."

Nevertheless, Dr. Ransome, whose eminent services in the prevention of phthisis I desire fully to recognise, and who will not, I hope, think that these remarks are designed in any way to depreciate the excellent work which he has done in this subject, was one of the pioneers who prepared a leaflet giving instructions to consumptives in the precautions which they were to take against the conveyance of infection by their expectorations, instructions which were given and explained to the out-patients attending the Manchester Consumption

Hospital. In truth, we believe that he is rather proud of the useful work which he initiated in this regard. Doubtless, Dr. Ransome would say that there is no inconsistency, that precautions such as he enjoined would be needful in dark, dirty, and ill-ordered houses, which would not be so necessary in a well-ordered hospital. But is this really quite so clear? Is it to be believed that in any consumption hospital patients were permitted to expectorate on the floor, or that strict cleanliness ever failed to be maintained; or, if negligence in these particulars obtained, that no harm resulted. We have, it is true, certain statements made in reference to Brompton Hospital, in the air of which Klein, however, was able to demonstrate visible tubercle bacilli.

The observations of Dr. Theodore Williams, recorded in the *British Medical Journal* of 1882 and quoted by Dr. Bulstrode via Hirsch, in reference to Brompton Hospital, scarcely seem to us to bear out Dr. Ransome's contention. "The deficiency of ventilation in the out-patient department," says Dr. Williams, "must have led to a large accumulation in the wards of the products of respiration, and also of our friends the bacilli. We, consequently, ought to have seen an extension of the disease to non-consumptive cases or to the nurses, but nothing of the sort occurred—only the usual results of hospitalism, i.e., erysipelas and sore throat. Among the physicians, assistant physicians, clinical clerks, nurses, and others, to the number of several hundred, who had served in the hospital (not a few of them having lived in it for a number of years continuously) phthisis had not been more common than it may be expected to be on the average among the civil population of a town, and only in three or four cases could the outbreak of it be brought in any way in connection with the individual's residence in the hospital." (The italics are ours.)

It does not appear that any effort was made to trace the fortunes of those of the staff who did not develop symptoms noted at the hospital, nor, indeed would such an investigation probably have been possible. It would appear that spittoons were used in the wards, and it may be inferred that the patients were not permitted to expectorate in the out-patient department. Why, then, should there be exceptional danger. As a matter of fact, in Dr. Coates' experiments, infection was not produced in guinea-pigs by dust taken from the out-patient department of the Manchester

Consumption Hospital, very different from the results obtained with dust from private houses. Moreover, there is undoubtedly much infection in the general civil population. Why, then, should more be anticipated in Brompton Hospital. But we may assume, in general, that consumption hospitals have been well-lighted and clean, and that the staff have been well-nourished. It may be added that the attendants have, probably, as a rule, been a very changing body, and that their subsequent histories will probably not have been easy to trace. It is scarcely to be credited that during the last twenty years the conditions maintained in consumption hospitals have been such as to expose the attendants to serious risks of infection.

The general immunity of the staffs in these hospitals may, therefore, be accepted without any serious effect on the simple contagion theory.

What is a "simple contagion theory"? Dr. Bulstrode contrasts the behaviour of enteric fever towards the staffs of fever hospitals with the behaviour of tuberculosis towards the staffs of consumption hospitals. But the greater frequency of infection of the staffs of fever hospitals may be due in part to less accurate knowledge of the modes of infection, or to a less rigid enforcement of rules, especially among the younger nurses. The infection of nurses, moreover, varies widely in different hospitals, and, at different periods, in the same hospital. For years it may be absent in presence of numerous cases. At other times it may assail several members of a hospital staff, even in the absence of any known cases. Here, then, we are in presence of no "simple contagion theory."

Similarly with tuberculosis. Were the favourable conditions obtaining in English consumption hospitals not to obtain, the immunity of the staff might disappear. Putting aside the records of the Prussian Catholic nursing orders, let us consult Straus as to the experience of the hospitals in Paris.*

"Debove," says Straus, "insists that stay in the hospitals is particularly dangerous by reason of the large number of the consumptives in the wards. The hospital becomes a veritable focus of contagion. Trousseau, Charcot, and Peter have already pointed out the frequency of phthisis as the terminal malady, in ataxics, epileptics, paraplegics, and persons suffering from chronic rheumatism who have been condemned to a prolonged sojourn in the hospital."

*Straus. *La Tuberculose et son Bacille*, Paris, 1895, p. 449.

"Phthisis," says Debove, "is of extreme frequency amongst the subjects of chronic illness, who have remained a long period in the hospitals. . . . As to the attendants, they furnish a considerable number of phthisical cases. It is now a long time since I first made this observation. At the Bicetre, where I was a physician at the infirmary, I was not merely struck, but shocked by the number of phthisical cases amongst the staff."

Laveran also calls attention to the very high phthisis rate amongst the hospital attendants of the French army (1875). Kirchner (1894) directs attention to the excessive mortality among the hospital attendants of the Prussian army, due chiefly, no doubt, to phthisis.

It would appear, then, that the immunity of English consumption hospitals is conditional, and that under unfavourable circumstances, such as doubtless frequently occur in private homes, this immunity disappears.

The hospital experiences, then, given by Dr. Bulstrode, by no means dispose of the contagiousness of phthisis, nor do they seriously affect the question, excepting in so far as they may be made to serve as guides to the conditions under which infection may be averted.

Dr. Bulstrode gives the experience of certain well-known institutions in other countries. Thus, at Falkenstein, 225 non-tuberculous persons have stayed at the sanatorium, and none have been known to contract consumption, though many have stayed for six months. But such an experience, even if no subsequent infection developed, could only militate against the effects of coughing "droplet" infection. As regards Görbersdorf, the statistics are contested by Cornet. There is, further, some evidence of the importation of phthisis into health resorts, as at Mentone, Meran, Cannes and Davos.* As Cornet has pointed out, statistics furnished from health resorts must be accepted with some reserve.

We agree, however, that, considering the undoubtedly very small incidence of phthisis on the staffs of well-managed sanatoria, one would be surprised to find the presence of a sanatorium leading to the spread of phthisis in the neighbourhood. This could only happen if the staff were for some reason or another exposed to unusual risks, or from the occurrence of the disease among laundry women working at the sanatorium and residing

outside. It is, indeed, to the last-named, or a similar, circumstance that the alleged diffusion has been ascribed, and the danger is one, therefore, which it should be easy to control.

We would now make some observations on the mortality statistics of phthisis. The uncertainty attending the exact significance of the term phthisis, whether we compare one period or one locality with another, decidedly cripples the wing of the statistician. There is, however, no doubt that during the last fifty years or so a steady fall has been taking place in the death-rate from tuberculosis over England and Wales, or that the incidence of tubercular mortality, which, at the beginning of the period, was greatest in women, is now far greater on men than on women.

An explanation of the remarkable changes which have occurred would help us greatly in determining the directions in which we may look for further improvement. Such an explanation, however, is not readily forthcoming, and no doubt Dr. Bulstrode acts wisely in not committing himself too definitely to one or another view. He does, however, give interesting figures illustrative of the connection between poverty and mortality from phthisis, unquestionably an intimate one both of cause and effect. The relation is probably one mainly of cause, since otherwise it would be difficult to account for the fall in the phthisis death-rate as the general well-being advanced.

But the relation may not be altogether, or even chiefly, a direct one. On the one hand, we have had, no doubt, a higher average of nutrition, and better clothing. On the other, as the result of a period of great sanitary activity, we have had an immense diminution in those ailments which predispose to phthisis. Housing has immensely improved, and especially so in respect of the lighting of rooms. As regards overcrowding also, the average effect of the great industrial expansion has, apparently, been towards diminution. The proportion of persons living under comparatively healthy conditions has steadily increased as the general well-being has improved, but the effect on health has been largely due, we may be quite certain, to the amount of the increasing wealth which has been deflected to hygienic improvement.

There is, however, a theory which has been advanced to explain the great fall in the

phthisis death-rate, which is deserving of careful consideration, viz., that segregation of phthisical persons in the union hospitals has played the greatest part in it. If I do not accept this view, it is not because I would deny that such segregation, if continuously maintained over the whole period of the illness and with ample care against infection, is capable of producing a very great effect, especially if the consumptives could be induced to have recourse to it at a sufficiently early period. But, as matters have presumably fallen out, these conditions cannot be supposed to have been generally fulfilled. On the other hand, as a potentiality, it presents a goal worth striving towards. It is probable that there has been another great factor at work. In spite of the many common lodging-houses still in existence, there has, we believe, been a great diminution relative to the whole population, of those aggregations of human beings without settled occupation and living at a low level, who have been housed in the most unhealthy manner, especially as regards light, ventilation, and cleanliness, and who have consequently suffered to an excessive extent from phthisis. The conditions of the Millbank penitentiary, and of the unwholesome barracks have disappeared. From such breeding-places of phthisis the disease has been, and is being, in divers ways, propagated upwards through various social levels. The removal of these conditions from the quarters of the military and naval forces, and their relative diminution among the civil population, has, doubtless, played no insignificant part in the improvement which has occurred.

From this point of view, the extent to which, in any locality, the school board or education authority, have replaced the old insanitary and overcrowded schools, by new, well-lighted, well-ventilated, and carefully-supervised ones, assumes great importance, as does also the attention paid to the sanitary conveniences at schools. One observes, therefore, with satisfaction that Dr. Bulstrode has devoted a chapter to the occurrence of phthisis in schools. Attention may be directed to an inquiry made by Dr. James Cowie, of Burton-on-Trent, on the incidence of phthisis on elementary schools, so far as revealed by the notification records of Manchester.

The material to hand is, doubtless, not utilisable for statistical purposes, but Dr.

Cowie is justified in calling attention to the excessive incidence on the less sanitary schools. It is probable also, having regard to the habits of children in respect of expectoration, that the effects of exposure to infection would be most manifest in the later years of school life and after the children had ceased to attend school.

Amongst other factors which have resulted from industrial expansion and the consequent development of the country, one would be inclined to lay some stress on the diminution of intermarriages.

No less interesting is the shifting of the incidence of phthisis from the female to the male. Now in some rural counties and in mining counties the female phthisis death-rate still exceeds the male, though in these also the reversion is progressing. Hence the total effect must have been due largely to the urbanising of the population. Yet, probably, not entirely. Is there also a relation to the disappearance of the milkmaid? In addition to the great factor of urbanisation, there is, of course, another—viz., the tendency with increasing prosperity for a larger section of the community to take the burden of heavy toil away from the woman. To these two great factors probably we may attribute the alteration in the incidence of phthisis from women to men—at all events, in major part.

I must apologise for this *excursus* into a very fascinating part of the subject, which is yet of great moment; an apology needed because of the numerous *lacunæ* which are necessarily left unfilled.

It would be impossible, however, within the compass of such an article as this to review the statistics of phthisis. At the same time there is one piece of work by Dr. Longstaff which Dr. Bulstrode quotes very fully, and which may, therefore, perhaps be assumed to receive his approval as a criticism of the attitude of the etiologist towards the study of individual facts. Now I am at one with Dr. Bulstrode in thinking that, if the mathematician and statistician—and Dr. Longstaff is both—is in a position to control and check the work of the etiological inquirer, his assistance would be of the highest value. I think it needful, therefore, to devote some attention to this piece of work.

Dr. Longstaff thus states his thesis:—

A. B., a healthy man, to all appearance free from

* Cornet, p. 274.

any phthisical taint, marries a consumptive wife, C. D.; after a year or two C. D. dies; A. B. is found to be phthisical at the time of his wife's death, and dies of the disease after a short interval.

Several collections of such cases, many of them very striking, were published, and the inference was drawn that they only admitted of explanation on the hypothesis of infection of the man by his wife, or *vice versa*.

On the other hand, it may be maintained that phthisis is a very common ailment, and especially fatal between the ages of twenty and fifty; and that consequently, as a mere matter of chance, such cases must occur more or less frequently.

As the matter is one, the importance of which cannot be exaggerated, it seemed worth while to attempt to ascertain from the materials at hand how frequently such coincidences might be expected to occur as a *pure matter of chance*; on the hypothesis that phthisis is *not* a communicable disease.

"The available data," proceeds Dr. Longstaff, suggested the following form of the problem:—

Required.—To find in how many cases in England and Wales during the decade 1871–80 both husband and wife die of phthisis, *assuming the chances for married and single to be equal in all respects*.

By a most ingenious and beautiful piece of work, which it is a real pleasure to follow, Dr. Longstaff deduces from the total numbers of deaths at certain ages of males and females, and from the census figures for married males and females at those ages, with the aid of some assumptions on the way, that in the course of the ten years there should have been 4,363 coincidences of phthisis in man and wife.

He thus states his conclusion:—

So that, in accordance with the *data* and the various necessary assumptions, we may state that, *during the ten years 1871–80 in England and Wales, assuming marriage to have no influence upon phthisis, by selection, infection, or otherwise, it would happen 4,363 times that both husband and wife would die of that disease.*

Now it is, of course, an impossible assumption that tuberculosis is a non-communicable disease, and, we have, therefore, to examine whither the various assumptions lead us. On the hypothesis of communicability, and as a first approximation, we are expected to produce a number of presumed infections between man and wife which shall exceed the number of infections which would take place between man and wife on the hypothesis that infection

is not more likely to be conveyed to married persons than to indifferent persons in the community, in addition to the number of coincidences due to infection of man and wife from indifferent persons. We cannot say, as a matter of abstract reasoning, nor without a special inquiry directed to this point, that such demand is reasonable. Are married and single persons equally liable to infection? The married state stands in sharp contrast with the unmarried in respect of the extent to which the two classes are to be found aggregated with other human beings.

Surely married persons are, on the whole, more vigorous than the unmarried. As regards selection by marriage it has been suggested that there may be a selection by consumptives of weak mates. But the selection is probably the other way, the strong man sheltering the weak woman, and the strong woman the weak man.

We recall the large section of the community who live in common lodging-houses, in which phthisis runs riot, and who, for the most part, are unmarried actually, and practically all virtually; the large army of human derelicts who suffer excessively from phthisis; the great multitude of young people who do not enter the married state because of phthisis or other conditions of bad health; the excessive exposures to infection of men and women working in crowded, dusty, and dark workshops; the excessive invasion, at the period selected, of persons aggregated in institutions or in buildings appropriated to the Services. For these reasons we cannot admit that the demand on the etiologist that he shall produce out of 148,000 couples more than 4,363 apparent infections is, in the abstract, necessarily a just one.

Nevertheless, let us, for the moment, accept the assumptions of Dr. Longstaff, and the figure which he deduces. The following figures will be interesting.

From Straus' treatise we quote the following experiences (p. 456). Leudet (of Rouen) found that out of seventy-four marriages in which one of the partners was tuberculous, in sixty-four instances the other remained free from the disease, although in two-thirds of the cases an interval of upwards of eleven years had elapsed. In thirteen *only*, the remaining partner became tuberculous, of whom six had hereditary antecedents, while seven had not. Thus, only in seven out of seventy-seven was

marital contagion probable, or one in eleven, as against the one in thirty-four asked for by Dr. Longstaff.

Leudet, of Eaux Bonnes, finds that out of 112 widowers or widows of consumptive persons, only seven were attacked by tuberculosis. Cornet gives the following particulars in his book on tuberculosis:

Of 159 couples, Brehmer found that in 19, or 12 per cent., both were tuberculous. Haupt found thirty cases in 260 couples, also 12 per cent. I, personally, says Cornet, investigated 594 couples, and found that in 135 cases, or 23 per cent., both partners were tuberculous. These figures do not necessarily imply that there was always an etiological relationship between the cases.

As a fact, the percentage of cases in which both partners of a marriage are tuberculous is far larger than is indicated by the above figures.

But the question is not to be gauged by such figures, however favourable.

As regards our Manchester figures, it is to be remembered that no special investigation has been made to ascertain clinically that the remaining partner is or has been tuberculous, apart from proved records or facts. Moreover, we have not recorded instances as likely to have been due to infection, unless they fulfil certain conditions. A number of coincidences have been rejected. Hence, in taking the Manchester figures we are imposing a severe test as regards the number of coincidences. I will give first the facts as regards 1906 and 1907.

The numbers for 1907 are, married men reported as phthisical, 471, married women, 309—total married couples, 780; number of these likely to have been infected from a consumptive mate, 17 men, 29 women—total 46. Number less likely, 5 men, 11 women—grand total 62. Thus the proportion to married persons in 1907 was 1 in 12·6, while Longstaff's corresponding proportion is 1 in 34. The figures are, of course, not quite comparable, but they show clearly enough that his demand is far more than fulfilled.

For 1906 the published figures for infection are, man from wife 21, wife from husband 20, the number of married men notified 415, of married women 237. We thus get 41 histories of infection out of 652 couples, or 1 in 15·7.

Since the above was written, Mr. Lock has got out the whole of the facts since the notification of phthisis came into force in Manchester, and these are exhibited in the following table.

TABLE shewing the histories of infection, more or less probable, between man and wife as ascertained, for the most part, by highly-qualified observers, in Manchester.

Year.	No. of cases.	Married.			Sources of Infection.		
		M.	F.	Total.	Husbands.	Wives.	Total.
1900 ...	1324	267	201	468	27	13	40
1901 ...	1505	360	230	590	17	22	39
1902 ...	1449	335	221	556	29	20	49
1903 ...	1363	324	212	536	24	31	55
1904 ...	1216	308	223	531	25	22	47
1905 ...	1382	367	304	671	26	22	48
1906 ...	1393	415	237	652	20	21	41
1907 ...	1588	471	309	780	40	22	62
Total ...	11220	2847	1937	4784	208	173	381

The proportion of histories of infection to all known couples is 1 in 12·6. The proportion of 4,784 couples out of 11,220 notified cases is far too low, as many of the latter could not be traced after discharge from the union hospitals.

Leaving the statistical part of the question, I would now refer briefly to a chapter in Dr. Bulstrode's book on certain factors predisposing to tuberculosis, viz., poverty, alcoholic excess, overcrowding, dampness of soil, the effects of occupation, the breathing of foul air, insanity. The factors which he selects for consideration are dealt with separately, and the evidence of connection or the absence of connection adduced is considered, as if each factor existed singly. In this way, no doubt, we get a clear view of the subject, and the observer can weight the different factors as he will, in making up their sum of influence. That it is necessary to consider them together as well as separately will be seen on a consideration of any one factor such as overcrowding. Figures are given from the Annual Reports of Sir Shirley Murphy, showing the death-rates from phthisis year by year in London districts graduated according to the proportion of total population living more than two in a room, and the increase in the death-rate from phthisis as overcrowding increases is, year by year, very striking. But this is all in one locality. Now, in any given locality, overcrowding is an expression of poverty, waste, poorly-paid and often unhealthy occupations, inferior housing, etc. All this is implied in the term overcrowding. Is it necessarily the closer aggre-

gation of human beings which is reflected in the higher death-rate. If so, those, if there be any such, who consider only the infective process and not the infected person, would be inclined to point to these figures as a vindication of the infective character of tuberculosis. We should not like to have to rely, however, on such support. If Manchester be compared with London and Liverpool, the crowding of the population in rooms is considerably lower in the first city than in the other two. Yet the death-rate from phthisis is higher. To what is this circumstance due? Is alcoholic excess under consideration? We have reason to believe that alcoholic excess produces lesions predisposing to phthisis. Yet, do we, as a matter of fact, find phthisis prevalent among those of the better-off classes who are addicted to excess? Is it not probable that such excessive incidence as exists among alcoholics in the poorer classes is due largely to the frequenting of infected public houses, and to poverty of nutrition?

Doubtless, all these factors are important, singly, or in combination. Unquestionably the spread of phthisis is largely dependent on the soil on which the seed falls, more, perhaps, than in any other disease. Let us, if we can, change the soil. In the case of Manchester, for example, we may hope, in course of time, to have no living-room, workshop or place of refreshment which is not abundantly lighted and always clean. We may find means to consume our smoke and banish our fogs. Employment may become very much steadier, and overtime be a thing of the past. Our young people may be well-nourished, well-drilled, and healthy. The soil may be so drained as to remove dampness. But, with the best intentions, these things may not be very rapidly accomplished. Meantime, we have to consider that there go two things to the making of tuberculosis—the receptive individual and the reception of the tubercle bacillus. If we can intercept the tubercle bacillus, the soil, however receptive, does not, as we have seen, become tuberculous.

It thus becomes a question how we can do most good, by improving the individual, by giving him a better environment, or by intercepting the tubercle bacilli before they can assail him.

All three lines of attack must be essayed. The Education Act of 1907, the Children's Bill of 1908, and the Housing Bill, if they become law, will greatly further the first two

objects, and will help to divert a larger portion of the national wealth to the upbuilding of the national well-being. But we have, at the same time, to remember that every factor which has been regarded as assisting in the preparation of the individual for invasion by tubercle bacilli may be present; yet, in the absence of the parasite, there will be no phthisis; while in the presence of abundant infection the strongest person may succumb.

If, then, we could intercept and destroy the tubercle bacillus in the house and workplace, as well as in food, we should very quickly exterminate tuberculosis. It is because the extent to which this can be effected has not as yet been realised that so little has been done in the provision of administrative means. It is true, no doubt, that, hitherto, more has been effected by the provision of good and well-lighted houses than by work under any notification scheme, and that the improvement of ventilation and lighting, which goes on apace in the newer workshops, contributes largely to the same end. But so, also, will any well-devised and sufficiently active administration for dealing directly with infection.

What, then, is it that we may hope to attain under a notification scheme?

1. As previously noted, a great variety of facts relating to the circumstances of exposure to, and conditioning the occurrence of, infection are collected.

2. The consumptive person and the family receive definite instruction in the personal precautions to be taken, and in the need for cleanliness and fresh air. Visits are paid by the sanitary inspectors and health visitors every month or two months, according to the requirements of the case, to see that the instructions given are carried out.

3. Disinfection of the house, and, as far as possible, of clothing is carried out, so that the household may start afresh, so far as the presence of tubercle bacilli are concerned. Spit bottles and boxes and papers to cough into are supplied, with instructions how to use them.

4. When any doubt can exist as to the nature of the case, specimens of expectoration are examined, and also in new cases discovered, or from persons believed to be suffering from phthisis and standing in etiological relationship with the notified case.

5. In Manchester, arrangements are made, in suitable cases, for removal to a hospital,

Delamere Sanatorium, the Consumption Hospital at Bowdon, one of the Union hospitals, Clayton Hospital or Mr. Crossley's Home in Openshaw.

6. Every workshop is known, and its history of phthisis recorded. In the majority, notices with regard to expectoration are suspended, and letters are frequently written requesting managers to take special measures to secure cleansing where these appear to be called for.

Similar notices are suspended in the common lodging-houses.

7. Every person visited and instructed is likely to become a centre of information in the neighbourhood.

I cannot admit that any doubt exists as to the value or influence of this branch of administration. Were there nothing else to produce for it than the light which it throws on the modes and conditions of dissemination of tubercle it would still be of high value.

How is anyone without such an inquiry to form a just opinion in regard to the degree of infectiveness of tuberculosis. These inquiries need careful training and cannot at first be properly carried out by any medical man, no matter how able he may be. They cannot, in my judgment, be carried out so successfully in hospital, even if there be abundant leisure for investigation. Nor will any medical man be able to elicit all the facts accessible without subjecting himself to a severe training for the purpose.

The information thus obtained has a value only second to experimental work, and is absolutely necessary for the purpose of convincing people of the applicability of experimental work to human concerns.

Compulsory notification of phthisis has evident and marked advantages, but we hesitate to advocate its general adoption, chiefly because we feel certain that it cannot, as yet, be secured without conditions attached which will cripple administration.

We may now consider the statistical portion of Part III. of the Report in so far as it relates to the notification of phthisis. The method pursued is to chart out the death-rates from phthisis in London and in the towns which have adopted notification, and to compare the changes which have occurred in the latter with those which are visible in the greatest of non-notification towns. It is too early, as Dr. Bulstrode points out, to appraise the results of notification. Apart from that, however, it

would be difficult to arrive at a satisfactory result on this method. Whatever the statistics may reveal, one would assert that, as far as they go, the results of notification have unquestionably been valuable. Unfortunately, the staff available is limited by consideration of expense, and it is necessary to bear this in mind in weighing up what has been accomplished. How is it possible to gauge what would have happened in any town had notification not come into play? The conditions in different towns are widely different. Certainly London affords the least useful comparison of all. It is the centre of intellectual ferment. The question of notification has been discussed in the capital repeatedly. It is doubtful whether there is any London practitioner who is not familiar with the personal precautions which a patient and his friends should take and it is probable that instruction has been almost universal. To this the discussions on notification and segregation must have tended. Some of the effects of notification are there, even where the actual fact is not, and, probably, there is no large town of which this is not more or less true.

Besides, no one denies that much may be effected by general sanitary action, if such action were sufficiently in evidence. In addition to the personal precautions which we suspect are generally taken, it is probable that the union and other hospitals in London have carried out, to no small extent, that effective and persistent segregation which Dr. Newsholme has thought of as applying to the country generally. Undoubtedly this would have a great influence. Great sums have been spent on housing schemes, and immense efforts put forth to improve the conditions of housing. It is probable that great advance has taken place in the hygiene of the schools. In many respects sanitary work has made great advances. We cannot accept London as a standard of comparison.

It is very difficult indeed to appraise what has been the effect of the notification of phthisis on the death-rate. We have endeavoured to obtain some further light on the subject by a study of the annual death-rates from phthisis obtaining in a number of towns—London, Liverpool, Manchester, Birmingham, Leeds, Sheffield, Salford and Newcastle. In Leeds, Sheffield and Newcastle, a drop occurs in the phthisis death-rate in 1902, and in 1903 a drop occurs in Liverpool, Manchester, Birmingham and Bolton. It would

seem, therefore, as if the great increase of employment, which occurred about 1899 and 1900, had to do with the lowered phthisis death-rate in those years.

How far this is a correct view there are no means of judging. Only in the case of Manchester can any sufficient control be applied. The marked drop in the death-rate in Manchester in 1903 was accompanied by no such drop in Salford. Hence, so far as any test is practicable, it may be said to be in favour of the drop in Manchester having been associated in Manchester with the working of the notification scheme. Again, the marked drop in the Manchester death-rate occurs in the fourth year after the adoption of notification, and the third after it came into full operation. Similarly, in Liverpool, there is a marked drop in 1905, being the fourth year after the scheme came into operation. In Sheffield a drop occurs in 1902, being the third year after the adoption of notification.

This is followed by a rise in 1903, the year in which compulsory notification was adopted. In 1906, the fourth year after the adoption of notification, there is again a very marked fall from the figure attained in 1902. In Bolton also a drop occurs, not only in 1903, but also in 1906, being the fourth year after voluntary notification was introduced. These facts must be taken for what they are worth; I attach no very great importance to them. The fact is, the method of comparison is probably fallacious. The population of Birmingham, outside the boundaries of the city, is comparable with that of the city itself. To a less extent this is the case with Manchester. The death-rate in these outlying portions is comparatively low, from phthisis, as from other causes. Nevertheless, if we put aside London, whose improvement is phenomenal and requires special explanation, Manchester, Liverpool and Sheffield exhibit in recent years the greatest aggregate improvement among Northern towns. The figures are as follows:—

ANNUAL DEATH-RATES FROM PHTHISIS.

	London.	Manchester.	Liverpool.	Sheffield.	Birmingham.	Leeds.	Newcastle.	Salford.
1897 ...	1.78	2.12	1.76	1.46	1.35	1.46	1.72	1.8
1898 ...	1.79	1.95	1.73	1.23	1.41	1.40	1.85	1.8
1899 ...	1.90	2.05*	1.83	1.36*	1.64	1.43	1.74	1.8
1900 ...	1.79	2.09	1.80	1.43	1.63	1.43	1.73	1.8
1901 ...	1.66	2.09	1.80*	1.41	1.73	1.41	1.98	1.8
1902 ...	1.60	2.08	1.80	1.17	1.63	1.31	1.63	1.7
1903 ...	1.55	1.85	1.63	1.34†	1.42	1.27	1.67	1.8
1904 ...	1.62	1.98	1.67	1.24	1.50	1.40	1.67	2.0
1905 ...	1.42	1.68	1.59	1.11	1.40	1.23	1.50	1.4
1906 ...	1.44	1.81	1.58	1.01	1.23	1.23	1.49	1.7
1907 ...	—	—	—	—	—	—	—	—

* Voluntary notification of Phthisis.

† Compulsory notification.

We have seen that this method of appraisal is unsatisfactory on the ground that each place requires separate investigation, and that the population within the area may not adequately represent the health of that area. But there is another disturbing factor. We do not know to what extent the introduction of notification may have disturbed the statistical equilibrium, a consideration which we cannot but mention, though it appears to militate against Manchester. In Sheffield, for example, it appeared decidedly to affect the death-rate for 1903.

No doubt, some such attempt as that made by Dr. Bulstrode to determine the effect of notification was inevitable, but one cannot see how the question is to be judged by statistics, at all events for some time to come, nor without more examination of the circumstances involved in each case.

We have already emphasised the close relationship, which, we think, should exist between the notification of phthisis and admission into a sanatorium or consumption hospital without payment.

But there will always be many persons who will remain at home, from ties of affection, or for other reasons. For these some form of public advice and control will be necessary.

If the examination of various investigations, recorded or alluded to in the Report, has led to controversial observations, I regret the fact, but find it unavoidable, seeing that, in my view, phthisis is simply and plainly an infectious disease, with laws of its own, no doubt, but a disease which may be brought under control by direct public administration.

Admitting that changes in the circumstances of the people, and sanitary improvements on the large scale have in the past had more influence on the course of phthisis than our limited administrative work, it is not now possible to say how much is being effected by those ideas which such administration represents. In our view the work of the trained medical investigator and instructor, if suitably developed, will take its full place in the prevention of phthisis, side by side with other social and sanitary influences.

What disagreement we feel with Dr. Bulstrode relates, chiefly, not to the notification of phthisis, but to the manner in which the facts relating to the infectiousness of phthisis have been marshalled, and, having endeavoured to put these in a somewhat different manner, I would recommend his valuable report to

the careful study of every one interested in the public health aspects of tuberculosis, as a storehouse of information, presented in a lucid style, well arranged, and easy of access. As regards the facts relating to sanatoria, and to their value as curative and preventive institutions, I know of no other work which is of equal value.

MEDICAL INSPECTION IN THE CITY OF WORMS.*

ACCORDING to the annual report for 1906-7 there are in Worms three medical inspectors for 6,300 children, giving one school doctor to 2,100 children (in Wiesbaden the proportion is one to 1,400 children, and in Darmstadt one to 700-1,500). Special attention is given to the examination of children at entry at age of six. The examinations are followed very closely by the head teacher, and the point of fitness or not for attendance is considered very carefully. For all entrants a health certificate is signed. In a few instances only the parents object to the examination, and in these cases a certificate of health from the family doctor is insisted upon. The older children are seen by the medical inspectors at occasional visits. The director of education was anxious to have definite visits arranged, but owing to other duties (they are apparently in private practice), the medical inspectors have not found this possible. With regard to cost of examination, etc., when parents are too poor to pay, voluntary societies in connection with the schools bear the expense. Amongst the elder children serious dental caries exists to between 85 to 90 per cent. A special investigation into tuberculosis was made and the children discovered taken into hospital, the cost again being borne by various public and private associations—the mayor's fund, the society for sick children, the workmen's unions, etc.

The examination of entrants gave the following results:—

	Group I.	Group II.	Group III.
Number	248	408	366
1. Nutrition { 1. ...	197	181	245
2. ...	35	189	119
3. ...	16	38	2
2. Cleanliness { 1. 248	314	310	
2. —	72	56	
3. —	15	—	
3. Scrofulous	13	24	19
4. Skin diseases ...	—	10	27
5. Rickets	9	32	20
6. Other bone diseases	10	10	11
7. Chest & abdomen	4	12	7
8. Dental caries ...	199	319	275
9. Mouth, nose, and pharynx	1	11	9
10. Speech defects ...	6	7	5
11. Eye diseases	4	27	14
12. Ear diseases	5	19	2
13. Parasites	—	29	25
14. Other diseases ...	—	36	1
15. Remaining under observation	19	51	29

* Zeitschrift für Schulgesundheitspflege, February, 1908.

TWENTY YEARS' METROPOLITAN ADVANCE IN PREVENTIVE MEDICINE.

By DR. SIDNEY DAVIES.
Medical Officer of Health of Woolwich.

Presidential Address to the Metropolitan Branch of the
Incorporated Society of Medical Officers of Health.

IN his jubilee presidential address in 1905, Sir Shirley Murphy gave an eloquent and most suggestive review of the progress of public hygiene in the fifty years of the existence of the Society of Medical Officers of Health. In the following remarks it will be my endeavour to examine into the advance of the past twenty years, more especially in London, in a few directions, availing myself without stint of the work of the distinguished past president of the society.

Twenty years ago, at least, one of the sanitary authorities of the Metropolis had not even appointed a medical officer of health, and very few had whole-time officers. No diploma in public health or previous experience was compulsory for public health appointments. There was no Public Health Act for London, whose sanitary legislation had to be sought among the numerous Metropolitan Management and other Sanitary Acts. Cases of diphtheria were not admitted to the hospitals of the Asylums Board. There were no public laboratories for bacteriological diagnosis. There was no compulsory notification of infectious disease. There was no obligation to provide damp-courses and cemented sites to new houses. Houses without water-supply, water-closets without water, cesspools immediately adjoining houses, and polluted wells were common. Drains and sewers were often very defective, and there was much sewage contamination of the soil. Education of the public by sanitary leaflets, if not unknown, was very limited; phthisis was scarcely recognised as a preventable disease; there were no female sanitary inspectors; and such subjects as infant mortality and alcoholism received little consideration outside statistics.

How great has been the development of sanitary administration in the past twenty years is well known to you. The previous twenty years had been characterized by the improvement of drainage (see last year's Presidential Address) and of water supply,

with consequent abolition of cesspools and contiguous shallow wells, and great reduction of enteric fever. (This is probably shewn as much in the disappearance of so-called typhus as in the fall of the actual enteric fever death rate). Improved sanitary administration, particularly as regards infectious diseases, may be said to characterize the past twenty years.

When we come to estimate the advance made by statistics, we have to recognise their fallibility, and that we have no measure at all reliable, except death-rates. General death-rates depend partly on the age distribution, and the progressive fall of the general death-rate, since 1870, is partly due to the diminished birth-rate causing the population to contain a lower percentage of infants whose mortality is high. Sir Shirley Murphy's annual reports show, however, that in each of the years, 1902 to 1905, the rate of mortality was considerably lower than that of the period, 1891-1900, at each of twelve age-periods of life and for each sex, except at the period eighty-five and upwards; and in his report for 1903 he gives a table of corrected death-rates, which shews that the proportion of the decline in the death-rate, due to the altered age and sex constitution of the population, is so small that for comparative purposes it may be disregarded.

The London death-rate fell from 24.4 in the quinquennium, 1861-5, to 21.0 in 1881-5, and from that to 16.7 in 1901-5. There was no decided fall till the quinquennium 1871-5. The percentage reduction was decidedly greater in the second period than in the first. The last given quinquennium, 1901-5, has shewn a greater reduction than any preceding one since 1860.

Sir Shirley Murphy shewed in his presidential address that, in England and Wales, nearly all the reduction of mortality has been among the so-called preventable diseases, *i.e.*, the seven principal zymotics, together with tuberculosis, puerperal fever, and influenza (*viz.*, 42 per cent., compared with 4 per cent. for non-preventable diseases).

The chief gain of life has been won from small-pox, whooping-cough, scarlet fever, enteric fever, and phthisis. If death-rates per 1,000 living are taken, there appears to be a reduced mortality from measles in each of the three past quinquennia, and the death-rate in 1901-5 appears lower than in any five

years since 1851. But when deaths of children under five are calculated on the numbers living under five, we see that, though the mortality in 1901-5 was lower than that in the two preceding quinquennia, it exceeded the average mortality in 1851-80. Puerperal fever is slowly diminishing, but it accounts for few deaths; the gain here is very slight. The return of influenza has kept the general death-rate from falling as low as it would otherwise have done. Influenza has been fairly persistent since 1890, but since 1895 has been accompanied by less bronchitis. There has been a remarkable decrease in bronchitis. Some of this decrease is probably due to change of nomenclature, coinciding with an increase of pneumonia. (See Dr. Tatham's letter in Annual Report of Registrar-General, 1905.) A steady persistent decrease at ages from ten to thirty-five corresponds with decrease of tuberculosis, and is, no doubt, really due to this. Of causes of death, important from their frequency, only one shews a persistent rise—cancer; and it is still undetermined to what extent this rise corresponds to the real increase of the disease, or to improved diagnosis and increased proportion of population dying at the later periods of life.

It appears, then, that we have to congratulate ourselves on a great reduction in death-rate, a reduction which is greater in the last twenty years than before, and greatest of all in the last five years; and we recognise that whereas 1886-1905 saw more energy spent in sanitary administration than any previous twenty years, the years since 1901 have witnessed an amount of public interest in health matters, and of rivalry between sanitary authorities in hygienic advance which is unparalleled.

Let us examine our gains and losses, and how we came by them. Notification with the resolute application of isolation and vaccination of contacts have successfully vanquished small-pox.

The death-rate from enteric fever has come down to one-third of what it was in 1871-80, but the reduction in the number of notifications since 1891 is not very great. There has, however, been a coincident and nearly equal fall in fatality. Infection is now commonly, if not usually, imported from outside London. Water is no longer a common source of infection, but milk and several other foods—especially shell-fish—are frequent

sources. Personal infection, carried by hands to food—and probably also by flies, is still frequent. We have done much to warn the public as to the danger of shell-fish, but we do not know all the ways in which milk may be infected, and personal infection is largely a matter of housing and personal habits, and has diminished, if at all, only in proportion to improvements in these respects. The great obstacle to the further prevention of personal infection is the difficulty of early diagnosis (which the Widal test has done a little to diminish), and the postponement of medical attendance.

The diphtheria death-rate increased after 1870, apparently from school aggregation, reaching a maximum in 1891-5. In the following quinquennium the adoption of bacteriological diagnosis and the discovery of anti-toxin serum were followed by a rapid decline, till in 1905 the death-rate fell to 0.12 less than it has been for thirty years, and less than ever since 1859, if croup is included. More complete provision of medical attendance and bacteriological examination should bring about the disappearance of the disease; but at present the fatality is diminishing more rapidly than the number of cases.

Phthisis is steadily yielding to the general improved conditions as to overcrowding, housing accommodation, cleanliness, etc., which have resulted largely from our efforts. No doubt, too, open-air treatment in sanatoria and at home have accelerated the fall of the death-rate in the last six years. But here we must recognise that voluntary notification has failed, and that little advance has been made in isolating advanced cases, and providing sanatorium treatment for early cases. Woolwich alone of London Borough Councils has made a beginning in providing sanatorium treatment, and the result has been eminently satisfactory.

The rapid decrease of whooping-cough mortality—for which there is no notification, no isolation, no anti-toxin—seems at first sight surprising. It has operated steadily since 1860, but much more in the last twenty years. My own experience is that the great majority of children get whooping-cough sooner or later, and presumably it is not the number of cases that have diminished, but the fatality. This diminished fatality—as with phthisis—is probably due to increased resistance of the individual resulting from improved conditions of

LONDON.

AVERAGE DEATH-RATES.

From Registrar-General's Annual Summary.

Period.	Rate.
1861-1865	24.44
1866-1870	24.34
1871-1875	22.88
1876-1880	22.18
1881-1885	20.98
1886-1890	20.00
1891-1895	20.20
1896-1900	18.96
1901-1905	16.66
1906	15.70

MEASLES.

The death-rates from Measles in the Administrative County of London :—

Period.	Death-rate per 1,000 population.
1851-1860	0.53
1861-1870	0.58
1871-1880	0.51
1881-1890	0.64
1891-1895	0.59
1896-1900	0.57
1901-1905	0.45
1906	0.41

The death-rates from Measles in the Administrative County of London per 1,000 children under five years.

Period.	Death-rate per 1,000 population.
1851-1860	3.89
1861-1870	4.18
1871-1880	3.65
1881-1890	4.74
1891-1900	4.82
1901-1905	3.90
1906	3.57

WOOLWICH AND PLUMSTEAD PARISHES.

Yearly death-rates from Measles and five yearly averages :—

1891 ... 0.63	0.51 average.	1896 ... 1.40	0.66 average.
1892 ... 0.37		1897 ... 0.04	
1893 ... 0.63		1898 ... 1.08	
1894 ... 0.60		1899 ... 0.15	
1895 ... 0.30		1900 ... 0.61	
1901 ... 0.18	0.21 average.		
1902 ... 0.36			
1903 ... 0.20			
1904 ... 0.23			
1905 ... 0.10			
1906 ... 0.24			

WHOOPIING-COUGH.

The death-rates from Whooping-Cough in the Administrative County of London :—

Period.	Death-rate per 1,000 population.
1841-1850	0.87
1851-1860	0.83
1861-1870	0.88
1871-1880	0.81
1881-1890	0.69
1891-1895	0.53
1896-1900	0.47
1901-1905	0.35
1906	0.26

The death-rates from Whooping-Cough in the Administrative County of London per 1,000 children under five years :—

Period.	Death-rate per 1,000 population.
1851-1860	6.56
1861-1870	6.53
1871-1880	6.02
1881-1890	5.34
1891-1900	4.21
1901-1905	3.13
1906	2.32

THE LONDON DEATH-RATES AND CASE-RATE FOR VARIOUS PERIODS.

SCARLET FEVER.

Period.	Death-rate per 1,000 population.	Case-rate per 1,000 population.	Case mortality per cent.
1861-1870...	1.13	—	—
1871-1880...	0.60	—	—
1881-1890...	0.33	—	—
1891-1895...	0.24	5.3	4.6
1896-1900...	0.14	4.4	3.0
1901-1905...	0.11	3.6	2.9
1906	0.11	4.3	2.6

DIPHTHERIA.

Period.	Death-rate per 1,000 population.	Case-rate per 1,000 population.	Case mortality per cent.
1861-1870...	0.18	—	—
1871-1880...	0.12	—	—
1881-1890...	0.26	—	—
1891-1895...	0.52	2.40	22.40
1896-1900...	0.45	2.92	15.62
1901-1905...	0.20	1.94	9.90
1906	0.15	1.7	8.6

ENTERIC FEVER.

Period.	Death-rate per 1,000 population.	Case-rate per 1,000 population.	Case mortality per cent.
1871-1880...	0.240	—	—
1881-1890...	0.190	—	—
1891-1895...	0.132	0.78	17.26
1896-1900...	0.142	0.82	17.50
1901-1905...	0.084	0.52	15.46
1906	0.060	0.3	16.2

PHTHISIS.

Period.	Death-rate per 1,000 population.
1851-1860	2.86
1861-1870	2.84
1871-1880	2.51
1881-1890	2.09
1891-1895	1.88
1896-1900	1.80
1901-1905	1.57
1906	1.44

life, and to more hygienic treatment of the disease. But why has not measles shared to any appreciable extent in the improvement? True, there has been some decline in 1901-5 compared with the previous twenty years. Woolwich is able to point to a marked fall in the measles mortality during 1901-5 as compared with the two preceding quinquennia. In 1901 the practice first became general throughout that borough of visiting every child notified from school as having measles, and the home of any child coming from a house where measles existed, and leaving and explaining printed instructions as to the hygienic treatment of the disease. It is too early to draw any decided inference, but the result so far as we have gone is decidedly encouraging.

Improved conditions of life and more hygienic surroundings during illness should certainly diminish the mortality of both these diseases. Perhaps this influence has really been generally at work with measles, but its effect has been annulled by some other influence such as school attendance. There has been a shifting of measles mortality on to the first two years of life from school aggregation, etc. (Sir Shirley Murphy, Ann. Rept. 1905, p. 25). Whooping-cough, however, apparently has normally its chief mortality under one year of age (supp. to 65th Ann. Rept. Reg.-Genl.) and school aggregation could therefore have little effect of this kind.

Scarlet fever, as remarked above, is one of the diseases whose mortality has most diminished. Here, too, we can point since 1890 to a coincident though smaller reduction in the number of cases as measured by notification. Assuming (and surely when we note the steady fall since the first sanitary Acts were passed it is not unreasonable to do so) that this decrease is mainly due to sanitary measures and not to so-called natural variations, we may enquire to which of the various lines of attack scarlet fever has yielded most—the improved conditions of life which have reduced phthisis and whooping-cough, home isolation, or notification with consequent hospital isolation. As the reduction has been much greater in scarlet fever than in the previously mentioned diseases, and isolation has been increasingly practised for thirty years, we naturally conclude that isolation has had a large share in the improve-

ment. When notification was enforced it was generally taken for granted that effectual isolation could not be obtained at home, and immense sums of money have been spent in the last twenty years on the construction and maintenance of isolation hospitals. Has this expenditure been justified by results? As regards small-pox we should certainly answer, Yes. Let us enquire whether the facts that are known indicate a similar answer for scarlet fever.

Since 1860 the average London annual death-rate in each decade from this disease has progressively diminished by nearly 50 per cent., and in 1901-5 it was less than one-tenth what it was in 1861-70. The Asylums Board was appointed to provide and maintain institutions for special classes of sick, insane, and infirm paupers, and the first fever hospital was opened in 1870. It was not until 1879 that the managers were authorised to admit into their hospitals patients who were not paupers. Up till this date, consequently, the number of cases admitted was comparatively few. In 1890 the admissions were 42.8 per cent. of notifications, and the number gradually increased to 88.6 in 1905. The rate of diminution of the scarlet fever death-rate has been no greater since hospital isolation became common than it was before. There is thus no evidence that hospital isolation has diminished the death-rate of scarlet fever. Notification of cases of scarlet fever was not made compulsory until 1890. In that year 15,330 cases were notified. The number has varied from year to year, the lowest being 11,398 in 1891, and the highest 36,901 in 1893. Here again hospital isolation seems to have had no effect on the number of notifications. If hospital isolation has not diminished the total amount of scarlet fever, the question arises has it diminished the mortality of cases that occur? From 1891 to 1895 the annual case mortality in London was continually above 3.7 per cent.; in 1896 there was a considerable fall, and since then the annual case mortality has remained constantly below 3.7 per cent. (Annual Report M.O.H., L.C.C. 1904.) The decrease was abrupt, while the increase in hospital isolation was gradual. In the year 1894, of the total cases notified 20 per cent. more were isolated than in 1893, but the case mortality was higher in 1894 than in 1893. It does not

appear that the diminished case mortality, which has undoubtedly characterised recent years, has any connection with hospital isolation. This is to the writer an unexpected result. One would have certainly thought that the isolation of a large percentage of the notified cases, in a well-equipped hospital, some of whom would otherwise have been inefficiently nursed in poor and badly-equipped homes, would have diminished the mortality. Perhaps the explanation is that whereas the great majority of patients from the poorer homes were usually removed to hospital, even before 1890, the greater part of the increase in the number of patients isolated has been among patients coming from superior and well-equipped homes.

There are two decided objections against any steps which encourage the idea that notification is necessarily followed by removal to hospital. The people now have much less objection to their children being removed to the fever hospital than used to be the case. But there can be no doubt that this natural feeling against separation does still often tend to the concealment of slight cases, and in other slight and doubtful cases, doctors occasionally postpone notification in deference to the strong hostility of parents to their children being moved. If it was known that notification would not necessarily be followed by removal to hospital, more cases would be notified, earlier notification of many cases would be received, and, consequently, more effectual home isolation would be obtained. Owing to improved housing this is more often attainable than it was twenty years ago. Many cases, however, are not notified because parents cannot afford to obtain medical assistance.

We conclude, then, that hospital isolation of scarlet fever, though necessary and beneficial for patients coming from poor and crowded homes, to the extent to which it has become general and semi-compulsory, has not diminished infection or mortality, but that notification and isolation (place unspecified) have been of great benefit.

Diarrhœa shows no marked diminution, although the formerly associated diseases, cholera, dysentery, and enteric fever, have disappeared or are disappearing. This, at first, seems surprising, but when we remember that diarrhœa is not usually spread by water

or by sewage, but by flies, and hands soiled by faeces, and that, though water is now usually pure and sewage effectually removed, flies are no less abundant and, probably, hands no cleaner, we cease to wonder that little progress has been made in dealing with this disease. The resistance of the individual, too, in this disease is probably less influenced by improved housing and pure air—like whooping-cough—than by proper feeding. Hand-feeding has not increased to the extent many imagine, but it certainly has not diminished. To control this disease we need such provisions as will enable parents to obtain immediate medical attendance, notification, and hygienic treatment, as well as scientific feeding of infants. Voluntary notification has been tried with a degree of success in Woolwich, but even compulsory notification can only be partially successful in the absence of the first requisite—prompt medical diagnosis. A crusade against flies, too, may well be tried. If it has no other result, it will stimulate the removal of accumulations of dirt.

In former days health legislation and health authorities dealt merely with the removal of conditions generally favourable to disease—nuisances, especially drainage, house construction, and removal of accumulations.

In the future we must study more the conditions favouring each particular disease, and deal more especially with individuals.

For this, indispensable requisites are means which shall make medical attendance available for all, further development of notification, and due supply of persons qualified by nature and training to deal with individuals in matters of personal health, *e.g.*, trained health visitors.

In conclusion, we may, I think, congratulate ourselves on the striking advance in prevention of disease made in the past twenty years.

Other professions may meet with larger rewards in the way of pecuniary gain and social honours, but I doubt if any other body of men are so blessed as we, in being able to see the fruit of their labours in the prolonged life and improved health, which we have been largely instrumental in bestowing on our fellow men.

THE UTILITY OF THE GERMAN "FREIBANK" SYSTEM AS A FACTOR IN SOCIAL ECONOMY.

By EMILIA KANTHACK (MRS. G. DE VOSS).

BY the "Freibank" in Germany is understood the sale of tuberculous or otherwise deteriorated meat under special conditions. Strictly speaking, two kinds of meat come on the Freibank for public sale:—

1. Raw meat, deficient in quality, but otherwise wholesome; and
2. Sterilized meat, sold ready for consumption (generally speaking, tuberculous meat).

In Germany, when meat is inspected, it comes under four headings:—

Class A.—Vollwertig (full quality).

Class B.—Minderwertig (poor quality).

Class C.—Bedingt tauglich (for consumption under special conditions only).

Class D.—Untauglich (condemned).

In towns where the Freibank system is adopted, classes B and C both come on the Freibank, B being sold raw, while C may only be sold after being cooked with special precautions.

In Hamburg there is no real Freibank, but there is an excellently-managed department for the sale of sterilized tuberculous meat. It is called the "Verkauf von Gekochtem Fleisch" (sale of cooked meat), and the preparation and sale of the meat are carried out within the confines of the large public abattoir.

The "poor quality" meat (B) is allowed to be sold in the ordinary way of trade, but is specially marked as such. "Full quality" (A) has a *blue* stamp on each joint, while "poor quality" meat has a *red* stamp. The wily butcher, no doubt, relies on the inexperience or lack of surveillance in some of his customers for escaping detection when he supplies meat B at meat A prices.

Meat inspection in Hamburg is thorough, but is mild in point of exclusion, except in the case of trichinæ. Any appearance of trichinæ brings meat at once under class D. In the case of tuberculous meat, when the disease is local, the affected glands, etc., are excised, and the meat comes under class B. Disseminated tuberculosis, early actinomycosis, liver-rot, and meat affected by other local parasites come under class C. Only advanced cases of such diseases come under class D.

I have seen the Hamburg plant for sterilizing tuberculous and otherwise diseased meat

and rendering it fit for human consumption, and the entire process of preparing, cooking, storing, and selling the meat was demonstrated to me through the courtesy of the chief veterinary officer, and of the head official who has charge of the department. There are very good laboratories in connection with the meat inspection, and all doubtful cases are sent there for examination. The average quantity of meat sterilized amounts to 1,000 kilos. per month. The sale is open to all who care to come for it, and the entire quantity is generally sold out each day of sale. What remains is stored in cold rooms until the next sale. The meat is prepared on Mondays, Wednesdays, and Fridays, and is sold on Tuesdays, Thursdays, and Saturdays from 6 to 8.30 a.m. in summer, and 7 to 9.30 a.m. in winter.

To prevent abuse, the quantity sold to one person is limited, but this restriction does not altogether meet the case, as restaurant-keepers have been known to send a number of separate individuals to buy small quantities for them.

The sale-room is a long gallery, with a slate slab, over which the meat is sold, and has a separate entrance and exit. The prices are posted up on a large board. The prices I saw were as follows:—

Dripping	...	...	30 pfennig
Lard	...	...	50 "
Tallow	...	...	40 "
Margarine	...	...	35 "
Brawn...	...	...	20 "
Pork	...	...	40 "
Beef (quality 1)	...	...	40 "
Beef (quality 2)	...	...	30 "

(A mark contains 100 pfennig and is a fraction under a shilling.)

The meat is prepared in the following manner:—

The sterilizing plant is constructed on the line of a steam-disinfector, and the meat, after being cut into large joints, bones and all, is placed on wire trays which are run into the large cylinders, of which there are two. It is cooked for two hours under pressure of half an atmosphere, the temperature inside the cylinder being 110° C.

The meat must reach 85° C. throughout and must be "grey" to the very centre. On being removed, the best pieces are separated from the bones and are sold separately. The bones are also sold separately. All the "trimmings" and odd pieces, pigs' heads,

trotters, calves' feet, etc., are chopped into small pieces and go into a large "copper" for further conversion into brawn.

The liquor which drips from the meat in the sterilizer is caught in a pan and run off through a tap. A litre or so of this liquor is given away to each purchaser of the meat.

The sterilizer is also used for "rendering" fat, and I was shewn a tray full of small strips of fat bacon, from which the fat was dripping into the pan below. This liquid fat is then clarified and sold separately. The premises were throughout characterized by a high degree of cleanliness and were roomy, light, and airy. The only perceptible odour was the normal odour of steaming meat and of wholesome broiling fat, the latter being anything but offensive.

There is no opposition to the "sale of cooked meat" at the abattoir on the part of retail butchers, as it does not infringe upon their own custom. There are many butchers in the immediate proximity of the meat market and these enjoy a flourishing custom. But the class which patronises the abattoir "sale of cooked meat" is a class by itself, and it is in the nature of things that such a sale can never rank as a serious competitor to the ordinary channels of supply, owing to the fact that it is both limited and very variable in quantity, and has no *daily* sale. There is a class of persons, living here and there in the town, and even in the remote outskirts, which has gradually grown to appreciate the products of the "sale of cooked meat"; these are, generally speaking, very poor women. They would probably otherwise do without meat, or only eat it very occasionally; as it is, they will often come considerable distances to fetch the meat, soup, brawn, and fat. It is clean, looks fairly appetising, is well cooked, and lends itself to artistic treatment in conjunction with onions and other savoury adjuncts, and this class has no prejudices against consuming tubercle bacilli, whether cooked or uncooked. They have a far greater prejudice against foreign bodies visible to the naked eye—such as maggots in cheap sausages.

There are 156 sale days in the year, and the average quantity sold at each sale amounts to a fraction over 77 kilos. This is a comparatively small quantity, taking into consideration the fact that Hamburg has on its register 9,176 persons receiving municipal charity—i.e., one applicant for relief to every 86.44 of the population, which is 793,133.

I consider that the main utility of the Freibank system is that it provides an excellent machinery for avoiding municipal waste. No one is out of pocket. The abattoir condemns a carcase, and pays the meat-dealer an indemnity for confiscating it, provided the meat-dealer has insured his cattle. The abattoir goes even further, and not only pays the meat-dealer the original price of his cattle, but hands over to him any profits that result from the sale of the condemned meat. After the working expenses are covered, all the profits go to the owner of the animal if the animal is insured. The insurance is not compulsory, but is readily paid, the charge for each head of cattle being three marks. Condemned meat that is not fit, even after sterilizing, for human food, is converted into "fertilizer," cart-grease, etc., on the same terms.

The Freibank in Hamburg, therefore, cannot be said to rank as a serious factor in municipal economy. The fact, however, that Hamburg is a large and flourishing port is a highly-appreciable factor in bringing good cheap meat within the reach of the poorest classes—provided they know the channels, and know how to utilise their opportunities.

There is a large number of ship's butchers who provide out-going ships with large quantities of joints of excellent meat, and the bones and "trimmings" from these joints are sold at 35 pfennig the pound (about 4d.).

Domestic Expenditure of the Poor.—Through the kindness of the secretary of the Hamburg Board of Charity, I received trustworthy information regarding the expenditure of the poorest classes. The Board of Charity is a municipal body appointed by the Senate to regulate all relief measures, and is the general filtering-bed for all charitable procedures. As every house and every individual is registered in Germany, information with regard to social economies is readily accessible.

From all I have heard and what I have myself seen, I find that the poorest class in Germany is, as a class, infinitely more advanced in the manner of choosing and cooking its food than the parallel class in England. With a few bones and bits of meat they make thick savoury stews with the addition of split peas, beans, potatoes, onions, etc. Herrings, sausages, bacon and pork are cheap and excellent in North Germany. The poor are much given to eating boiled pork and cabbage. Pork is sold at about 6d. the pound,

and a large cabbage may be had for a few pfennig. Potatoes are the cheapest and commonest food, and next comes black rye bread. Buckwheat porridge is also largely eaten. But the price of wheat, etc., has greatly increased of late years, and the conditions of life among the very poor are very much harder in consequence.

Much horse-flesh is eaten. In 1906, 5,500 horses were killed for human food at the public abattoir in Hamburg, an average of about 11.2 per week-day. The slaughter-house for horses is of the most modern construction, and is very light, airy and clean. Each horse is examined before it is killed, and again after it is dressed. Horse-flesh is sold at about 6d. per lb.

In Hamburg in 1905 there were 7,679 tenants of the poorest class. The rents are rising here in common with all larger German towns, the average rise per annum being 20 marks 12 pfennig. There is very much overcrowding, and the "lodger" is a universal factor in the overcrowding evil.

Rent.—The rent averages one-fifth of the wage earned. Having regard to the size, locality and convenience of the dwelling, the poorest classes pay, comparatively, a very high rent.

The rents are classified according to the number of rooms, with or without heating appurtenance. Many rooms are let to separate tenants, with permission to use a common kitchen. Some have a small kitchen attached to each room, but the kitchen is then not a living room, but a mere recess.

The cheapest rent is that for one room, without provision for cooking or heating of any kind, and this class of room costs from 1 mark 36 pfennig per week to 2 marks 78 pfennig, according to locality.

		Pfen-
		Marks. nigs.
The lowest rent for 1 room with stove is	...	2 7
" " 2 rooms, 1 with stove	...	2 12
" " 2 " each with stove	...	3 41
" " 3 " 2 with, 1 without stove	...	4 23
" " 3 " each with stove	...	6 0
" " 4 " 3 with, 1 without stove	...	6 73
" " 5 " 4 with, 1 without stove	...	7 23

Wages.—It may be roughly estimated that the wages amount to the rent paid multiplied by five. On the other hand, in a very large proportion of cases, the rent is met halfway by

the sub-letting, not only of single rooms, but of single beds in rooms shared with the tenant. The evils of this custom, both from the hygienic and the moral point of view, are obvious.

This state of things is largely due to the constantly increasing influx of single men from the rural districts.

The increase in the population of the largest German towns is out of all proportion to the general increase throughout the Empire, and is not due to the increase in the birth rate of the towns, but to the depopulation of the rural districts.

The increase in the population of Hamburg amounted to 34,712 in 1900, but it had increased by 58,766 in 1905.

It had increased at the rate of 13.75 per cent. in Hamburg, while it had only increased 7.52 per cent. in the whole Empire.

It is difficult to give figures of average wages, influenced as these are by a combination of variable factors. The casual labourer earns approximately 15 marks to 20 marks per week, and the artisan from 4 marks a day. There are, of course, a very large mass of dock labourers, whose work is not ill-paid, but is irregular. They frequently share their wages on co-operative lines—i.e., a number of men working on the same piece divide the joint sum of their wages into equal shares.

MALT VINEGAR.—At the Mansion House, on March 4th, two firms were fined for selling as malt vinegar, a mixture which was only water and acetic acid. It was said to be vinegar according to the certificate of the public analyst, but both defendants admitted it was not malt vinegar.

EXPORT OF MEAT FOODS TO ARGENTINA.—In connection with the arrangements made last year with the Argentine Government for the official certification of meat food products intended for export from this country to Argentina, the Local Government Board have designated the following Medical Officers of Health as certifying officers for this purpose: Dr. W. Collingridge (City of London), Dr. R. K. Brown (Bermondsey), Mr. F. W. Alexander (Poplar), Mr. G. Millson (Southwark), Mr. D. L. Thomas (Stepney), Dr. Charles Porter (Finsbury), Dr. E. W. Hope (Liverpool), Dr. J. Robertson (Birmingham), Dr. C. K. Millard (Leicester), Mr. T. W. N. Barlow (Bootle), Dr. A. L. Ormerod (Oxford), Mr. H. W. Beach (Great Yarmouth), Dr. A. Marshall (Lowestoft), Mr. William Brown (Carlisle), Dr. D. Campbell (Calne), Mr. H. D'Arcy Ellis (Brierly Hill), Dr. J. F. Little (Harrow), Dr. James Macdonald (Carlisle Rural District), and Mr. W. P. Briggs (Wigton Rural District).

THE LIFE HISTORY OF HOUSE-FLIES.*

By A. GRIFFITH, M.D., D.P.H.,
Medical Officer of Health of Hove.

A GOOD deal has been written lately about flies, and they have been held responsible for illnesses of various kinds, and especially for epidemic diarrhoea.

For some years I have taken an interest in watching house-flies, their relative numbers, their habitats, and the times of their appearance. I have noticed, as you all have done, that their occurrence in houses varies; even in one street some houses are swarmed, others are not. The few facts about them which seemed certain made me anxious to know more, and it struck me that by bringing flies under careful observation in cages, as well as out of doors, some points of interest might be cleared up.

Accordingly, in the summer of 1904, I made inspections of heaps of manure and other refuse about the town and adjoining country, and I attempted to study flies in boxes in the laboratory.

The inspection of manure heaps about the town only resulted in the discovery of small black flies, which appear earlier in the year than the house-fly, none of which latter were found in the stable-yards or elsewhere. Nor were my efforts to raise successive families in the laboratory any more successful; for example, sixty flies were put into a box on May 18th; these could not be induced to lay eggs until June 28th, and then there was only one batch, all of which soon died. The flies themselves gradually died without leaving any descendants, the last having lived in captivity for sixteen weeks.

Two other cagefuls were tried in August and September, but all died in a few days from fly-fungus, an acute infective disease which takes a week or ten days to prove fatal.

The artificial conditions were evidently not suitable; but, with the assistance of the sanitary inspectors, fresh cages were designed to admit as much air as possible, and to allow of easy cleaning, and these were made small enough to be put into incubators, and kept at certain temperatures.

It is a matter of common observation, that when a warm day comes in early spring there is a sudden appearance of flies, which come with the warm, and go somewhere else on cold days; the number of flies does not sensibly

increase for some weeks, but when warmer weather is established, there appear somewhat suddenly swarms of flies, which become a nuisance indoors and out, this increase being due to the production of fresh families.

I had noticed that flies were found earliest, and sometimes in great numbers, at a certain large refuse heap, where they appeared and disappeared according to the weather, long before there were any in the town, except in bakehouses and restaurant kitchens. It seemed to me that this must be due to the warmth of the heap, and on investigation, I found that at a depth of less than two feet from the surface or sides, the temperature was over 104° F., which sufficiently accounted for their preference; the crevices of the heap being safe and warm hiding-places on a cold night.

By noting the dates when flies first appeared in the country and in houses in different years, and also the dates when their increasing numbers became a nuisance, and putting these side by side with temperature charts, I found evidence to suggest that a maximum temperature of from 56° to 60° F. was necessary to wake them from their winter sleep, and a temperature of over 70° F. for reproduction.

My intention in keeping flies was to imitate these temperatures—in fact, to anticipate the summer, and see if I could get reproduction at an early date.

This was attempted during May and June, 1906, but without success. Two batches of perhaps 250 flies in all were kept in cages, fed, and incubated; although the temperature of the incubator, which was open at the top, varied from 60° F. to 80° F. or more, nothing happened. These appeared to be old flies which had slept through the winter, which may have accounted for their not laying properly; but it is possible, also, that in order to reproduce, they needed special food, either manure, or some kind of animal refuse; this is a point which I have tried to work out since, but I am not yet satisfied about it.

These flies all died within six weeks, one set from want of water, the water-tank in the cage (a Petri glass) not being attended to on a Sunday morning, was found dry on Monday, and all the flies dead; this happened more than once, and it may be taken as proved that flies cannot get on without water or some kind of moisture. Their fondness for moisture is well illustrated by the experience of a hot day in the country, when, as you know, if you perspire freely, swarms of flies not only buzz

round your head and face, but persist in settling upon you for the purpose of a drink. While I am on this subject of a water supply for flies, I may mention that if they are given water and no other moisture, several get acute dropsy of the abdomen, from which they recover in a few days when they have learnt the wisdom of abstinence.

Being a bit disappointed with these old flies, I thought I would start again in August, and this time I had better luck. Some flies were put into the cages on August 7th, and were supplied with various foods, and some manure in half-closed tins; they began to lay eggs in the manure in a few days, the number of eggs varying from 100 to 150 in a batch. The eggs were removed to Petri glasses with manure, but these did not answer, for the quantity of manure was too small; they became dry without generating any heat, and it was difficult to change the supply daily. Then tins were tried, open and closed, and finally open tins covered with muslin were used, some cool and some in an open incubator, and some in Hearson's at blood heat. I was thus able to get successive generations which lasted till February, 1907.

I will not take you through the detailed records and labour of each batch, but I have set out in tabular form a summary of some of them; nor shall I trouble you with interesting points of anatomy which were met with, but will only try to give you the results as concisely as possible.

The usual stages of a fly's life under the best conditions are as follows:—

Starting with the new-laid egg, which contains the larva ready to break its shell, this is hatched in about twenty-four hours, and the larva commences to feed at once, grows rapidly, changes its skin once at least, and by the end of four days is found in the pupa state; it remains thus for three days, and then the fly emerges pale and flabby. In a few minutes it has distended its own head, wings, and air-tubes generally, and is fit for flight. After ten days, the mother-fly can lay a new batch of eggs, which process it repeats at intervals of ten to fourteen days, till four batches have been laid, when it dies. The mother fly's life lasts, as far as I can tell, for four layings, the interval between them depending upon the temperature; making the duration of life from six weeks to three or four months, or more if no eggs are laid. As to the life of male flies, I will leave that an open question. The value

and interest of these different layings will appear when the local temperature charts are inspected in detail.

Circumstances modify the time of a fly's life and its successful rearing to a very marked extent, the whole life cycle being full of dangers; it is interesting to note how seriously unfavourable surroundings and food in its early hours affect its proper growth. Yet its later life is not free from excitements and risks, and it may be robbed of perfection even at the last by too much heat or too little moisture.

The change of skin under the best conditions could not be observed. Only in rare cases, where growth was slow and the whole larval period continued for about twenty days, it was noticed that during the fifth and sixth days the larvæ were inactive, and that next day the shed skins were found, and the larvæ were again wide awake. This, probably, occurs during the second day of life under natural conditions.

The effect of warmth is most interesting; when kept in the cold, the eggs did not hatch for forty-eight hours; the larvæ grew slowly, and took, in some instances, from twenty-four to thirty-one days before becoming pupæ; the flies did not emerge for another seventeen days in the longest case, and such slowly-evolved flies were small.

If the eggs and larvæ are kept at blood-heat (98.4° F.) with plenty of food, which must be moist, they become pupæ in four or five days; but this heat sometimes proves fatal to the larvæ, which are literally cooked, or to the pupæ, the flies being developed inside the puparia or shells, but being unable to get out. A temperature below 80° F. produces equally good results without risks.

These laboratory observations were confirmed by placing some eggs in a moderate-sized heap of fresh manure out of doors; it was found that the larvæ remained in the hottest part of the heap, but that the pupæ were all found nearer the surface, where it was cooler.

The laboratory conditions under which they thrive best were in an incubator open at the top, in which the tins were placed so as to leave a free circulation of air at the sides, the water in the jacket being between 68° and 77° F., and the air in the room at 60° F. or more. The larvæ in the tins would have a temperature of 65° F. to 75° F. At this temperature, the whole process from egg to fly was completed by the eighth or ninth day;

* A Presidential Address to the Southern Branch on October 4th, 1907.

and, in some instances, every larva, at any rate if its early life was safely passed, succeeded in becoming a fly of proper size.

A curious contrast to this occurred unintentionally; some larvæ were found in fat in a basin, and being well-grown already, some were put in the incubator uncovered; next day all were gone; the process was repeated, and the tin covered with a glass; again all escaped, but were seen to be dried up inside the incubator. More were put in, and tied in with muslin; this time they did not escape, but all were dead in the tin. The explanation was this—they were the larvæ of the blow-fly, which prefer cold, and evidently cannot bear warmth.

As seen in the table, I have tried starting eggs and larvæ in heat, and finishing them at a cooler temperature; starting them cold, and then transferring to heat. I have also done the same with pupæ, with these results:—

When the larvæ were kept in proper warmth until they formed pupæ, the flies came out even in a rather cold temperature, and quickly in the warm. When the larvæ were kept cool and the pupæ warm, some flies came out, but all were small; it has been a regular occurrence that cold surroundings and plenty of food have produced small flies, if any. Such small flies are incapable of reproduction; and herein is seen the wisdom of flies being able to lay more than one batch of eggs.

Small flies are found at the end of summer when the air has become cooler, and at the commencement of spring; these early flies being probably those hatched late in the preceding autumn. During the summer of 1907 there has been a large proportion of small flies, which have been produced by precisely these circumstances, viz., cool air and plenty of food; and I have no doubt that the larvæ were a long time reaching their full growth.

In order to fully prove the effect of heat, I kept some larvæ from one batch of eggs in the cold for fourteen days; and then transferred some of them to a warm place. Those left in the cold took ten more days to become pupæ, those in the warm only four days; but most of them, whether finished off in cold or warmth, failed to reach maturity, the process of growth being too slow. Many other batches reached the pupa stage safely, but did not emerge as flies. On opening the shells I found sometimes a shrivelled fly, sometimes emptiness.

At other times, when flies came out, they were deformed, having only one wing developed, or both wings useless. It is a curious sight to watch the efforts of these flies to get out of their shells; the head is distended until it looks like bursting, and the fly makes most frightful grimaces. So much for the importance of warmth.

Light is not essential at any stage, except that of the complete fly; in fact, darkness is preferred.

Other necessities for fly propagation are air, moisture, and fresh food. If kept without fresh food, or if the manure dried, the larvæ were starved, and with difficulty survived. If the manure was at all stale, so that ammonia was produced or moulds grew, they were killed. Probably this happens sometimes in nature; it at any rate explains why larvæ are rarely found in small heaps of manure, the temperature of which may rise in the centre to 78° F. or more, a very suitable heat; but the parent fly knows that a small heap may become too dry, or that if it becomes mouldy there will not be room to get a change of food. On the other hand, you may find fly-larvæ in quite small heaps of animal and vegetable rubbish, for this dries less quickly. An examination of the sanitary dustbin will convince you of this.

Adult, or perfect, flies have three great needs, the same as in their infancy, viz., air, warmth, and moisture; but they like sunlight, and they need very little solid food. If they are kept without sufficient air, they die of fungus; it is a striking fact, familiar to anyone who has kept insects, or indeed any animals, how rapidly they fall ill if not given abundance of fresh air.

If they are exposed to cold, they become sleepy and die. On one night in August the temperature fell to 50°, which was the coldest for four weeks. When I saw the flies in the morning, they were piled up in a heap, fighting for the little bit of sunshine which reached their box.

At a temperature of 80° F. to 100° F., they are very active and very thirsty; when the water in the incubator jacket reached 113° F. the flies looked dry, and one by one fell into the pond and were drowned; this being due probably, rather to the dryness of the air than the heat. Their need of moisture has already been mentioned, and is evident when we consider that they can only feed by sucking, which often necessitates moistening their food first.

The possible duration of a fly's life is difficult to ascertain. One male fly lived sixteen weeks in captivity, and was active all the time, except the last two or three days; others hatched in August lived between eight and nine weeks, and during that time laid four lots of eggs. It is reasonable to suppose that though they differ from moths and butterflies in laying more than one lot of eggs, yet they resemble them by laying down their lives soon after they have done all that they can do in this respect.

It is not so easy as it may be imagined to keep flies until they die of old age, for accidents will happen; one healthy cageful escaped through the door being left not quite closed; another died very suddenly, possibly through poison in their food, or in the paste used for re-papering their walls; others, again, died from want of moisture, from drowning, and various forms of violence.

As to the effect of temperature on reproduction, I failed to get reproduction in the early summer even with artificial warmth, but I succeeded in the late autumn, when most flies have given up all family thoughts, and are only looking for warm places to hide in. A batch of flies caged on November 22nd, laid eggs on the 23rd to 29th; again on December 17th to 24th, and again on January 3rd; they were kept in warmth all the time; without it they would have been inactive or asleep. But nearly all the flies hatched from these eggs were small, though grown in heat; only one batch were of good size; nor could I persuade any of them to lay eggs. The flies in one set were extremely small, quite pygmies; and these died from no apparent cause, probably from marasmus, after a month. Of course flies do not grow; the size depends on that of the larva when it becomes a pupa; from the same batch of eggs I have hatched large, medium, and small flies, but I have never seen the little ones really grow, though I fancied that the pygmies did seem a bit bigger after a few days.

It is important to know what are the usual breeding-places of the house-fly. My observations have shown me that small heaps of manure, and manure which is spread out, are rarely chosen by flies; that dustbins and ash-pits, which are usually dark, and contain animal and vegetable refuse, are favourite spots, whether lime is used for sprinkling them or not, and that large accumulations of fresh refuse and manure are the best of all. Old

manure is not good for them; it may be too cool, or may form ammonia, but, anyhow, it is not good food for the larvæ. The heaps of horse and cow manure in farmyards are ideal places for depositing eggs, and here you may find house-fly larvæ, together with those of other species. The feeding-places of flies are not their breeding-places; they will feed in bakehouses, kitchens, and dining-rooms, but they cannot breed there. They will travel long distances for food, and perhaps longer to lay eggs; their favourite food appears to be of the sweet variety, but they like fresh manure very much; it seems to be to them as meat, or beef tea is to us. In cowsheds close to which they are born, they are fairly abundant, especially when these are warm; but they are not likely to remain there for food if there is a choice near by.

It has been a point of dispute how flies pass the winter, whether in the fly or the pupa state. I think it is as flies. They do not usually lay eggs late in the autumn, the weather being too cold; if they do, the larvæ have a poor chance of reaching the pupa state. Granting that they could become pupæ, we get during the autumn some warm days, sufficiently warm to bring out these pupæ into flies; or supposing the pupæ not to be hatched out, where are they hidden? The larvæ live in heaps of refuse and manure. How many of such are left undisturbed until the warm days of March, April, or May? Their chance of survival would be very small indeed, dryness being fatal to them.

On the other hand, flies are abundant in kitchens and other warm places right through the autumn, and they appear on the first sunny warm day in spring, having hidden away in warm corners.

My laboratory records confirm these probabilities; some larvæ reached the pupal state on September 9th and 10th; on September 14th, one fly appeared, on September 17th one more; then the weather became colder, no more appeared until the 24th, when the sunshine tempted one more out in the afternoon; from the 24th to the 29th twelve more flies were hatched; and on October 1st, eleven were out, which completed the batch; the maximum temperature had risen on the 29th to 69° F. It is interesting to notice how some came out with a slight rise of temperature, others responded to the warmth of the sunshine, while others seemed to require a certain amount of accumulated heat.

A still later lot of larvæ, born on October 25th, became pupæ in the incubator by November 2nd, and were then turned out into the cold; none came to flies, but on examining them, I found the flies formed inside of the shells dried up. These experiences lead me to say that it is improbable that any pupæ remain as such through the winter.

I am not sure if the same applies to blow-flies; but I have one fact which suggests that it does; some bluebottle larvæ entered the pupa state on October 30th; remained so until December 3rd, when the flies came out; why, I cannot say, as the temperature seemed no higher than it had been.

Side by side with these observations, indeed as the real purpose of them, I had in mind a possible relation of flies to summer diarrhœa.

The charts of temperature (shown at the meeting) showing the dates at which flies first appeared, and when they became numerous, have also marked on them the deaths from diarrhœa in the district.

The history of five summers is worth careful study.

The year 1903 is particularly interesting. A hot spell in May lasts eleven days; during this time flies will be very busy laying their first batch of eggs; the larvæ will be progressing favourably, when a cold spell comes, which lasts till the 26th of June; the larval growth will be arrested, with the result that the flies are small and incapable of further reproduction, so that practically the first laying has been of no use. Another hot week occurs at the end of June, with more larvæ, which again are only permitted to grow slowly, and cannot reach perfection until the steady hot weather sets in at the beginning of August, at which time you will see that abundance of flies is noted. The cases and deaths from diarrhœa begin with this rise, even before the flies were a nuisance.

In 1904 the same thing occurs. The first rise of temperature is of no use to fly families; after a few hot days at the end of June, we have a hot spell in July, and flies are soon abundant. Diarrhœa deaths occur three weeks later, when the heat has continued and there has been no rain.

In 1905 my entry for flies being a nuisance is in August. Now this would be a late laying. There must have been an increase in July when I was away on holiday, but an added increase with a few more warm days in August; 1906 shows well the relation of tem-

perature to flies; and here the cases of diarrhœa and the coming of flies appear to be synchronous, the deaths occurring one or two weeks later; 1907 is very interesting. Though there has been very little rain, it has been cold; we find a rise after the second week of July. Larvæ will be growing slowly all along the line of 65°, and the resulting flies will be small. The great incidence only comes with a steady rise in September, during which the flies seemed to become more numerous every day. There has been a fair abundance of flies all the summer, especially indoors, but there were almost no diarrhœa deaths. There were numerous cases of diarrhœa beginning about September 20th, due, as I think, to the dry heat, and not to the flies.

The fact is, that prolonged dry heat promotes both flies and diarrhœa; these have a common cause, but one is not dependent upon the other, except under unusual circumstances.

The number of flies, given suitable food, seems to depend simply on the heat; rain only affects them in so far as it means less sun and less warmth. They can always protect themselves from wet, both in the state of larva and fly, but rain profoundly affects the diarrhœa incidence.

I am not going to argue that flies cannot carry the infection of diarrhœa. It is perfectly clear that, if a fly moves directly from a soiled cloth to the milk-jug, it cannot help carrying the germs to the milk; but, as a rule, I do not think that infection clings to the fly for any length of time. The fly is always cleaning itself, and abhors dirt on its body, and especially on its legs. Nor have visits to houses shown that there are any more flies in the houses or districts where diarrhœa is most common. Flies will go where there is continued warmth; for example, where a kitchen is used, and not a gas fire, and where there is refuse to be tasted or smelt.

There can be no doubt that nature has made flies for a purpose, and it seems pretty clear that this purpose is to get rid of rubbish by its being eaten by the larvæ, which do their duty nobly. It is probable that the adult flies' chief service in life is to provide fresh supplies of larvæ, and while they are serving this useful purpose, it is quite possible that they may become by their very numbers an annoyance and a nuisance, and even a danger. The means to be used in order to prevent them will be obvious if my previous statements are correct:—

1. We should not provide breeding-places, which are accumulations of refuse and of fresh manure. Dustbins should be emptied twice a week in the summer, for their whole life cycle is completed in eight or nine days; and manure should be removed from stable yards twice a week.

2. We should stir them out of their hiding-places in the winter, and out of our houses in the cool evenings.

3. We should keep our larders and cowsheds cool and well ventilated, and the milk covered.

I have recently been investigating the best methods to get rid of flies on a refuse heap, and to prevent them breeding there. I need hardly say to you that the solution of this lies not in dealing with the flies only, or chiefly, but with the larvæ.

Adult flies were sprayed with solutions of ammonia, formalin, carbolic acid, and lysol, which wetted the wings of some sufficiently to bring them down; but if left a little while the wings dried and they flew off, their subsequent fate being doubtful. Liquid paraffin or benzine kills them directly, but these are not usually applicable to the circumstances.

The larvæ were tested in glasses, various powders and solutions being poured or sprinkled on them; these included quicklime, fresh-made lime-water, salt, dilute acids, ammonia,

two solutions commonly used for sheep dipping, viz., sulphur dissolved in lime-water, and carbolic acid with soft soap—simple oils, turpentine oils, liquid paraffin, solutions of coal-tar disinfectants, and hot water.

Most of these had no effect, except to make the larvæ more lively; the only three kinds which destroyed them in a reasonable time were hot water, coal-tar disinfectant at a strength of 1 in 50 (preferably stronger), and the oils of paraffin and turpentine.

The coal-tar acids have also the advantage of preventing smell from rubbish heaps, and of keeping flies away by their smell; but they must be used with common sense, and in sufficient quantities.

I have in this address wandered from the strict lines of public health and strayed into natural history, a subject which has always had charms for me; but I hope that these studies, which have proved of great interest to me, have not been devoid of it to you. There is no difficulty in keeping flies once you get into the swing of it, and I venture to prophesy that their study, under both natural and artificial conditions, will prove amusing as well as interesting; and if I hope that some of my observations will be upheld, I have no doubt that others will be corrected by more careful study.

HOUSE-FLIES—TIMES OF STAGES.

Names of Families.		Egg to Pupa.	Pupa to Fly.	Conditions.
IN HEAT.		Days.	Days.	
1.	"Feldy" ...	4-5	4-6	Open incubator; all out successfully.
1a.	"D" ...	4½-6	3½	Ditto.
2.	"Aber" ...	5-6	4-6	Incubated at 37° several died in shells.
3.	"S.C." ...	7-8 (37°) Ditto	4 (37°) 4-7 (cold)	
4.	"Hospital" ...	7-8	4-5	Small heap, out of doors; hot weather.
IN COLD (with some help).				
5.	"K" ...	11-12	11	Some flies large and some small. Grubs in large tin.
6.	"R" ...	15-17	5-8 (hot, 37°) 8-9 (cold)	Grubs in large tin.
7.	"X" ...	16	9 (cold)	All flies small.
IN COLD (a comparison being made with parts).				
8a.	{ 1. Simple ... 2. Duplicate ...	24-26 (all cold) 14+4 (hot)	10 (all cold) Dried up, 37°	Petri glass, little air.
8b.	{ 1. Simple ... 2. Duplicate ...	24-31 12+6 (hot)	11 (one small one and one dried in shell) 3-6 (open incub.)	Petri in room. All flies small.
9.	"Aug. 17" ...	23-27	4 and 14-17 (hot days after cold spell).	Flies mostly small, but some fair size; all out finally.

A COUNTRY COUSIN'S VIEWS ON PUBLIC HEALTH.*

By F. J. BURMAN, L.R.C.P., L.M. (Edin.),
M.R.C.S. (Eng.),

Medical Officer of Health, Bolton-on-Dearne and Wath-on-Dearne.

DURING the last few years preventive medicine has made very rapid strides, but it is still a matter of regret that the public, and even people of superior education, are slow to follow. There still remains such great ignorance of the very A B C of sanitation, and also of what constitutes ordinary cleanliness, together with a refusal to believe in the necessary precautions to prevent the spread of infectious diseases, as to make the good results which ought to arise from our sanitary progress, very slow of attainment. Moreover, those to whom this knowledge is most necessary, unfortunately, refuse to believe in it, or to act upon it.

Still, we may be thankful that this knowledge does percolate to the lower strata of society to some extent, but the habits of past generations are not easily shaken off, and one is continually hearing the fatalistic dictum with regard to children's diseases, "If they have to have it, they will have it." But, notwithstanding all this, one does find, as the years pass by, that much larger numbers of the working classes are now willing to take the precautions, and submit to the restrictions necessary to stamp out infectious diseases. There are many agencies at work at the present day to encourage the working-classes to live healthier lives, than was the case in the century just closed. The great question of the housing of the working-classes is just now occupying the minds and the thoughts of sanitarians, and those of us who had the privilege of visiting the Model Cottage Exhibition at Sheffield last October, and were able to compare it with the similar exhibition held in the same place in 1905, must have been struck by the immense strides which had been taken in this question during the last two years. I am one of those who hold that if you give a working man and working woman a clean house, with a paved, well-drained yard which can be kept clean by sweeping, and with windows which are large and let in

plenty of light, then the man and woman will bestir themselves and do their best to keep their house and premises in a clean and sanitary condition. But when one sees houses with little poky yards at the back, which never can be kept clean, blocked up by other buildings, with windows through which air and sunlight can never properly penetrate, what encouragement have the people to keep their home and surroundings healthy and clean? I believe these garden cities and model cottage exhibitions, despite the criticisms showered upon them, are a big stride in the right direction.

Another important sanitary step taken of late years is the establishment of isolation hospitals. I believe I am correct in saying that with the exception of two districts, the whole of the West Riding is now supplied with isolation hospitals, and, in spite of what one often hears to the contrary, there is no doubt that they are a valuable aid in the prevention of epidemics. At the same time their administration requires every care, and I am afraid that it is carelessness in administration, coupled with their great expense, which has brought them somewhat into disrepute; a hospital carelessly administered may prove to be a great curse instead of a blessing, and instead of preventing disease may actually be the means of spreading it. No doubt isolation hospitals do raise the rates, but still it is, or ought to be, a great satisfaction to a ratepayer to be able to send his children about the streets of his town confident in the fact that the scarlet fever patients are safely isolated in the hospital. Again, there can be no doubt as to the lives which are saved by being treated in hospital, where poor children, and adults, too, can get what they so much lack in their own homes—good nursing.

Another important step in the prevention of disease is the passing of the Midwives' Act, which will, in 1910, place all midwives under the control of the county medical officer of health, and through him under the medical officer of health of the district where the midwife lives. In my own districts I periodically visit these good ladies and see that they are doing their work properly in the matter of keeping their registers up-to-date, the cleansing of bags, instruments, dresses, and their own persons. This entails a certain amount of extra work, but it has the advantage of causing the midwives to look up to one as a person whose orders must be obeyed, and should

there be any neglect on the part of any midwife or any misconduct I am sure to hear of it from some of the neighbours. It is also a great help to the midwife to have someone locally to whom she can appeal in any difficulty, and I may say that such appeals are comparatively frequent.

The immediate effect of legalising the profession of midwife has been to deprive the medical practitioner of much of his midwifery. In some respects the middle-aged or elderly practitioner is decidedly better without it, but to the young man commencing practice it is a more or less serious matter, for undoubtedly nothing can so well help on a young man and settle his patients' confidence in him than a first confinement carefully attended and brought to a successful termination, both as regards mother and child. In a few years no doubt the state of things will be altered, as the older midwives who have obtained their certificate on the sole ground of having been engaged in midwifery for twelve months previous to the passing of the Act die out, for I believe that unless the profession of midwife is taken up much more actively than at present, the supply will fall far short of the demand, and midwifery will then revert to the medical profession.

With your permission, I should like to make a few remarks on what are to my mind the future requirements of the public health service. First, we want the establishment of a Board of Health, with a Minister of Public Health at its head. The Local Government Board has much more work to do than it can ever get through, and it keeps relegating this duty and that duty to the county councils, which would be all very well and proper, were it not for the fact that the county councils have already far more work than they can do. Anyone who has had dealings with members of a county council know very well how onerous are the duties of a county councillor, and these duties are increasing rapidly year by year.

Another requirement is security of tenure. Owing to the fact that the post of medical officer of health may be declared vacant at short notice by an urban council, which council is continually changing its composition, it renders the life of a country medical officer of health who tries to do his duty fearlessly one continual period of apprehension lest he should not be re-elected as the annual election comes round. Hence it makes

him very particular in what he says in his annual and monthly reports; on the other hand, did he feel secure in his appointment, he would fearlessly state what were his opinions in sanitary matters.

Another great requirement is compulsory notification throughout the country of phthisis, combined with the free supply of pocket spittoons to each case. We put up notices that spitting is a penal offence, but are we just to the poor patients in doing so? Is it fair to require them to swallow their sputum, to their own injury by the ease with which tuberculosis of the intestine may be set up, and so shorten the life of the poor patient and increase his misery? There is also another way of looking at it. How is it possible for a female, with the present ridiculous fashion of having the pocket in the skirt of the dress, to carry a spittoon with her? There is nothing for her to do in a public place but to spit or to swallow.

Last, but not least, we require some stringent regulations to enforce the consumption of smoke from our colliery and factory chimneys in the open country. I am aware that the towns do enforce regulations to abate the nuisance, but we require to have the same by-laws in the open country, where the amount of smoke which a colliery or factory manager may emit from his chimneys, to the detriment and injury of his neighbours, is absolutely unrestricted.

This nuisance is annually becoming worse, and in my own district we shall have no oak trees left; but this is a question which should be tackled by the county councils, and cannot possibly be dealt with by the urban and rural district councils, owing to the vested interests concerned.

ANTHRAX.—There were four deaths due to anthrax, registered during 1906, in the County of London. One was that of the wife of a carman, the others were those of three men employed respectively as a horsehair dresser, a skin importer's warehouseman, and a stevedore, who had been engaged in unloading foreign hides. Four other cases, attended by recovery, occurred in persons employed in Bermondsey. The first was a man who had been handling foreign hides; the second a woman, the source of whose infection was unknown; the third a man who had been handling hides, but the hides were tanned; the fourth, a man who had been carting bristles. A further case occurred in Poplar, that of a man who had been employed in carrying hides in the St. Katherine Docks.

* The Presidential Address of the Yorkshire Branch of the Incorporated Society of Medical Officers of Health, read before the Branch on November 27th, 1907.

REVIEWS.

MEAT AND FOOD INSPECTION. By Wm. Robertson, M.D., Medical Officer of Health, Leith. London: Bailliere, Tindall & Cox, 1908.

Dr. Robertson's book is, as we should expect from his previous writings, thoroughly practical in character, and it will be found helpful by medical officers of health and other officials engaged in food inspection. The book is divided into two parts. The first part consists of sixteen chapters relating to the practical work of food inspection, including chapters on the structure of slaughter-houses, cowsheds, piggeries, and stables, methods of slaughter, meat preservation, and storage and milk supply; the second part is devoted to the law relating to food inspection, and includes a series of admirably concise footnotes on leading cases, etc., by Mr. R. H. Millar, the Public Prosecutor for Leith. Dr. Robertson is no mere compiler; he writes from his own experience, and his book is full of practical "tips," from which the student of public health may learn more of actual administrative work than he could gather from some more elaborate treatises. The book is free from padding, it is brought well up-to-date, and it can confidently be recommended as a serviceable handbook.

PRACTICAL HOUSING. By J. S. Nettlefold. Letchworth: Garden City Press, Limited, 1908.

Mr. Nettlefold, the well-known Chairman of the Birmingham Corporation Housing Committee, has produced an exceedingly interesting book, which is sold at a surprisingly low price, and will, no doubt, be widely read now that the Government Housing Bill has brought the housing question prominently before the public. Although Mr. Nettlefold has called his book "Practical Housing," it is chiefly devoted to what is now spoken of as "Town Planning," and it contains a large amount of valuable information, copiously illustrated by maps, plans, and photographs, on what is being done in various parts of the world in this latest development of housing reform. Mr. Nettlefold has evidently taken considerable pains to collect trustworthy material, and his discussion of the knotty points of the housing problem is eminently fair and impartial. We think, however, that he might have given more credit to those local authorities that have made use of Part I. of the Housing Act. The work done by these authorities cannot fully be estimated unless account is taken not only of what has been provided but also of what has been swept away. It is true that the process of slum clearance under Part I. has been expensive, but that must be ascribed to the legislature that devised the cumbrous and costly procedure of the Act, and not to the local authorities charged with its administration. But, as Mr. Nettlefold says, "our methods, not our motives, differ," and even those who may regret the author's lack of sympathy with the "municipal house builder" will wish his book a wide circulation.

CORRESPONDENCE.

ISOLATION HOSPITALS.

To the Editor of PUBLIC HEALTH.

SIR,—Time did not allow me to deal with all the subjects raised by Dr. Beale Collins in his remarks on my paper, to which he refers in his letter of March 16th. My intention was to avoid the question of the relative advantages of hospital and home isolation in connection with scarlet-fever and diphtheria, but to lay more stress than has been customary in discussions on this subject on the extent to which cases of these diseases may, in certain districts, escape the provisions of the Notification Act, and thereby tend to neutralise the benefits of isolation of known cases, whether at home or in hospital.

The fact that over ten, and even over twenty, per cent. of definite and diagnosable attacks of scarlet-fever and diphtheria occurring within a definite period (to leave out of account suspected and carrier cases) may escape detection if the ordinary sources of information are alone relied upon, can hardly fail to explain partially why isolation, disinfection, etc., has had little effect in controlling their prevalence in certain districts. It may even afford some explanation of the figures, which have been quoted, to compare the behaviour of scarlet fever in districts, some of which rely chiefly on home, and others on hospital, isolation. If in two such districts, one of which has a hospital and the other has none, ten per cent. of the cases escape notification during an epidemic, it is unreasonable to expect the disease to be stamped out much more readily in the latter than in the former district. If the proportion of unrecognised cases be greater in the hospitalised than in the other district, the average prevalence of the disease may easily be greater also.

Probably a number of patients are removed to hospitals who might with advantage be treated at home. This will largely depend on the character of the houses in which scarlet fever and diphtheria are especially liable to occur, and also on the frequency with which inmates are engaged at employments that are important in this connection. It is a big responsibility to acquiesce in the continuation of such trades as dairying, printing, laundry work, and the like, by members of a household in which ideal isolation of a case of scarlet-fever or diphtheria cannot be maintained. Lodgings for such wage-earners are not easy to obtain, and compensation is illegal and costly.

The cases of these diseases, which escaped notification and were detected by the method which I outlined in my paper, were quite definite ones, which would hardly have been missed by any competent medical man, if he were called in at the onset. There should be no difficulty in requiring strict isolation, and, inasmuch as their discovery is calculated to prevent large numbers of other cases, the resources of a properly-equipped isolation hospital should not be unduly taxed.

I doubt if many medical officers of health will agree with Dr. Beale Collins' fatalistic views as to the undesirability of attempting to stamp out scarlet fever. Even when the average character of the disease is mild, rapidly fatal cases have a way of occurring, and the ultimate effect of an epidemic is not to be judged by the case-mortality founded on registration certificates containing the words "scarlet fever." My paper was not confined to this disease, and such views are undoubtedly fallacious with regard to diphtheria.

Isolation hospitals are not always unmixed blessings, but in towns, at least, are almost indispensable. The pity is that the knowledge, which we are now obtaining as to their proper construction, such as is embodied in Dr. Corbin's paper, was not in the possession of local authorities many years ago.

Yours faithfully,
A. E. PORTER.

Reigate, April 6th, 1908.

PROCEEDINGS OF THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

GENERAL MEETING.

A GENERAL Meeting of the Incorporated 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, April 10th, 1908. *Present*:—Sir Shirley Murphy, Drs. J. S. Tew, Randle Harper, F. E. Fremantle, Meredith Young, J. Howard Jones, F. E. Cane, G. Sowden, F. J. Burman, G. F. McCleary, C. R. Dykes, R. M. Craven, W. L. Hunter, Wm. Butler, E. H. Snell, A. Kidd, W. McC. Wanklyn, W. A. Bond, J. W. Hembrough, Herbert Jones and Mr. W. Whitaker (members); and Messrs. J. Montague Harris, F. Letchfield, N. Macfadyen, A. G. Bagshawe, Mrs. Fremantle, and Miss Churton (visitors).

Sir Shirley Murphy took the chair in the absence of the President.

MINUTES.

The Minutes of the previous meeting held on 13th March, 1908, having been published in the April number of PUBLIC HEALTH, were taken as read, approved, and were duly signed by the chairman.

ELECTIONS.

The following candidates, having been nominated and balloted for, were declared by the Chairman duly elected:—

AS FELLOWS.

Butcher, William James,	Westhoughton	M.O.H. for
M.R.C.S., L.R.C.P., D.P.H.,		U.D.
Westhoughton, Lancs.		
Stephens, James B., M.B., B.S.,	Willesden U.D.	
D.P.H., The Hospital, Neas-	(Assist.)	
don, N.W.		

AS MEMBERS.

Hodgson, John Edward, L.R.C.P., M.R.C.S., Captain (R.A.M.C.), Military Hospital, Devonport.
Ritchie, John, M.B., Ch.B., D.P.H., 1, Arboretum Road, Edinburgh.

NOMINATIONS.

A list of nominations was read by the Hon. Secretary.

ELECTION OF PRESIDENT FOR SESSION 1908-9.

A ballot then took place for the election of a president for the year 1908-1909, the candidate being Edward Sergeant, L.R.C.P., M.R.C.S., L.S.Sc., F.C.S., Medical Officer of Health for the County of Lancaster, who was declared by the chairman to be elected unanimously. Dr. Sergeant was proposed by Dr. A. E. Brindley and seconded by Dr. T. W. N. Barlow, also being

nominated by Sir Shirley Murphy and Drs. F. Vacher, J. Wheatley, D. S. Davies, H. O. Pilkington, J. Middleton Martin, J. Priestley, Herbert Jones, E. W. Hope, A. Greenwood, J. Howard Jones, and Meredith Young.

A paper was then read by Dr. F. E. Fremantle upon "The Garden City, Rural Housing, and the Government."* A discussion took place at the close of the paper in which the following took part:—Sir Shirley Murphy, Mr. J. Montague Harris, Miss Churton, Drs. Wm. Butler, F. J. Burman, Herbert Jones, and W. A. Bond.

North-Western Branch.—A meeting of the above Branch was held at the Chemical Club, Victoria Hotel, Manchester, on Friday, March 20th, 1908. *Present*: Dr. A. E. Brindley (president), in the chair; Drs. Peck, Greenwood, Hamilton, Wheeldon, Holt, Coutts, Thomas, Arnold, Daley, Wilkinson, Sergeant, Buckley, Hitchon, Paddock, Welsh, Wheatley, Garstang, Young, Fraser, Buchan, Harper, Corbin and Barlow.

Letter of apology for absence was read from Dr. Barry. Minutes of last meeting were read, confirmed and adopted.

Drs. BUTCHER, Medical Officer of Health for West Houghton and Farquharson, Medical Officer of Health for Radcliffe, were unanimously elected Members of the Branch.

Dr. Barlow was appointed representative of the Branch on the Council of the West Lancashire District of the National Registration of Plumbers, vice Dr. Coutts resigned, and Dr. Brindley, representative of the Branch on the Council of the Manchester District for the same Society.

Drs. Greenwood and Garstang were appointed representatives of the Branch for the forthcoming Congress of the Royal Institute of Public Health, to be held at Buxton in July next.

Dr. Linton, M.B., C.H.B., D.P.H., Assistant Medical Officer, Monsall Hospital, M. B. Arnold, M.D., D.P.H., Assistant Medical Officer of Health, Blackburn, James Johnson, Medical Officer of Health, Bispham, were nominated for election as Members.

Dr. BUCHAN then read his Paper on "Personal Infection in Pulmonary Tuberculosis."†

Southern Branch.—A meeting was held at the Town Hall, Portsmouth, January 3rd, 1908. *Present*: Drs. Griffith (president), Willoughby, Sandilands, A. Mearns Fraser, Hugh Scott (hon. sec.).

A letter was read from the National Registration of Plumbers (Hants, Dorset and Isle of Wight District), asking that one representative should be elected on the District Council. In view of the fact that two medical officers of health already attended the council, it did not appear to be necessary to increase this number.

Dr. A. MEARNS FRASER read a paper on "The Sale of Tuberculous Meat and Milk."

A discussion took place on the subject of the paper, and Dr. Fraser was thanked for his remarks.

* The paper will be published in a subsequent number of PUBLIC HEALTH.

† To be published in June 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.

Annual and other Reports.

Annual Health Report of the Isle of Wight, R.S.D., by Dr. J. Albert Gibson. Annual Health Report of the West Lancashire R.D., by Dr. G. E. Scholefield. Report to the L.G.B. on the Sanitary Circumstances and Administration of the Borough of Leigh (Lancashire), with special reference to the prevalence of Enteric Fever. Report on the Health of Tottenham, by Dr. J. F. Butler Hogan. Annual Health Report of the Borough of Longton, by Dr. J. W. Dawes. Registrar-General's Weekly Returns. Health Report of the Borough of Ashton Manor, by Dr. Francis H. May. Annual Health Report of the Bromyard, Dore, Hereford, Ledbury, Leominster and Weobley R.D.'s, and of the Bromyard U.D., by Dr. Herbert Jones. Report on the Carnarvonshire Combined Sanitary Districts, by Dr. P. Fraser. Annual Report of the Education Committee of the City of Manchester. Annual Reports and Vital Statistics for the R.D. of Bucklow, and the U.D.'s of Knutsford, Middlewich, Winsford and Biddulph, by Dr. T. W. H. Garstang. Annual Health Report of the Borough of Kingston-upon-Thames, by Dr. H. Beale Collins. Annual Health Report of the Bath U.S.D., by Dr. W. H. Symons. Annual Health Report of the Borough of Richmond, by Dr. J. H. Crocker. Minutes of the Metropolitan Asylums Board. Annual Health Report for the Burgh of Paisley, by Dr. Alex. Robb. Annual Health Report for the Paignton U.D., by Dr. Chas. W. Vickers. Report to the L.G.B. upon the Sanitary Circumstances and Administration of the Wimborne and Cranbourne R.D., by Dr. W. W. E. Fletcher. Report to the L. G. B. on the Preparation and Sale of Vinegar, in Relation to the Administration of the Sale of Food and Drugs Acts, by Dr. J. M. Hamill. Annual Health Report for the Borough of Tunbridge Wells, by Dr. Wm. Stanford. Annual Health Report for the Borough of Crewe, by Dr. Andrew J. Laird. Third Annual Report to the Educational Committee of the City of Coventry. Annual Health Report of the Borough of Ilkeston, by Dr. John J. Tobin. Annual Report of the Sanitary Conditions (*vide* Statistics) of the Borough of Hanley, by Dr. John Clare. Dr. F. St. George Mivart's Report to the L.G.B. on the General Sanitary Circumstances and Administration of the Bedale R.D., and on a Prevalence of Diphtheria in the township of Bedale. Report on the Health and Sanitary Condition of the County of Ayr, by Dr. C. R. Macdonald. Health Report on the Borough of New Windsor. Health Report of Plympton St. Mary R.D., by Dr. S. Noy Scott. Report on Grain Crops of the Province of Saskatchewan. Bulletin of the State Board of Health of Maine. Health Report of the Royal Borough of Kensington, by Dr. T. Orme Dudfield. Health Report of the City of Aberdeen, by Kenneth Cameron, Chief Sanitary Inspector. Report on the Borough of Middleton, by Dr. F. J. Wheeldon. Report on the Ilford U.D., by Dr. C. F. Stovin. Annual Report upon the Health of Blackburn, by Dr. Alfred Greenwood. Health Report of the Borough of Hornsey, by Dr. Harold Coates. Annual Report on Hunslet R.D., by Dr. Joseph Buck. Annual Report of the Burgh of Govan, by Dr. Jas. Barras. Annual Report of the Health of Stafford, by Dr. F. Milnes Blumer. Health Report of the City of Dundee, by Dr. Templeman. Health Report on the Erdington U.D., by Dr. A. Bostock Hill. Annual Report on the Metropolitan Borough of Chelsea, by Dr. Louis C. Parkes. Annual Report of the Public Health Department of New Zealand.

Journals.

Hospital. Tropical Medicine and Hygiene. American Journal of Public Hygiene. Canadian Practitioner and Review. Bristol Medico-Chirurgical Journal. Sanitary Record. Transvaal Medical Journal. Australasian Medical Gazette. Pacific Medical Journal. Proceedings of the Royal Society of Medicine. Royal Sanitary Institute. Official Circular of the County Council's Association. All-India Hospital Assistants' Journal. Caledonian Medical Journal. American Journal of the Medical Sciences. Glasgow Medical Journal. Annali d'Igiene Sperimentale. British Medical Journal. Municipal Journal. Royal Institute of Public Health. Medical Review of Reviews. Reale Società Italiana d'Igiene. Royal Statistical Society. American Statistical Association. Experiment Station Record. Bulletin de l'Administration du Service de Santé et de l'hygiène. Birmingham Medical Review. Lancet. Water. Monthly Bulletin of the State Board of Health of Massachusetts.

Pamphlets.

The Economic Aspect of Preventable Deaths, being an inquiry into the financial loss due to Unnecessary Mortality in the Transvaal, by Dr. G. D. Maynard. Experiments with Preserved Meat: Report from the Hygiene Laboratories of the Royal Army Medical College, by Major D. W. O. Beveridge, D.S.O., and Captain H. B. Fawcus. Transactions of the Cremation Society of England.

Statutory Rules and Orders.

Factory and Workshop: Regulations for the Use of Horsehair. Dangers and Unhealthy Industries.

Practical Meat and Food Inspection.

Published by Robertson, 10s. 6d. net.

Practical Hints to Health Visitors.

By Greta Allen. Published by The Scientific Press, Ltd., 1s. nett.

Krankenhauwesen und Heilstättenbewegung in Lichte der Sozialen Hygiene.

By Dr. Alfred Grotjahn. Published by F. C. W. Vogel, Leipzig, 10 marks.

Cancer: Relief of Pain and Possible Cure.

By Drs. Skene Keith and George E. Keith. Published by Adam and Chas. Black, London. 2s. 6d. net.

Tuberculosis: Its Origin and Extinction.

By Dr. W. Pickett Turner. Published by Adam and Chas. Black, London. 2s. 6d. nett.

OBITUARY.

HENRY COLLIER LECKY, M.A., B.M., B.Ch. Oxon, D.P.H. Oxon.

We deeply regret to announce the death of Dr. Lecky, which occurred at the Sussex County Hospital, Brighton, on March 31st. Dr. Lecky was taken ill suddenly in a shop at Brighton, and on being taken to his rooms was found to be suffering from a right-sided pleurisy. Pneumonia soon developed, the opposite lung became involved, and death occurred at the end of the third week. Dr. Lecky, who was only twenty-nine years of age, received his professional training at Oxford and St. Thomas' Hospital, and subsequently held the posts of House Physician to the Radcliffe Infirmary, Oxford, House Physician to St. Thomas' Hospital, and Resident Medical Officer to the County Asylum, Lancaster. For nearly two years before his death he had been Resident Medical Officer to the

Borough Sanatorium and Deputy Medical Officer of Health for Brighton.

Dr. Lecky was a man of unusual ability, high character, and charming personality. He was devoted to his work, and, had he lived, he would undoubtedly have occupied a distinguished position in the public health service. Wherever he went he made friends, who will long cherish his memory. From a medical friend who knew Dr. Lecky well at Brighton comes this tribute:—"In the short time we had known him at Brighton we had come to love him. His brightness, unselfishness, and unfailing courtesy and kindness to all compelled affection. I never heard him say a word I would have wished unsaid, and never saw him do a thing I would have wished undone. His modesty was almost a source of weakness, so over-anxious was he always not to hurt another's feelings. I cannot recall another character quite like him."

Dr. Lecky was an occasional contributor to PUBLIC HEALTH, and an article from his pen on Calmette's Tuberculin Ophthalmic Reaction appeared in the April number. This was his last contribution to a medical journal. His untimely death is a sad ending to a career of great usefulness and greater promise.

RECENT PUBLIC HEALTH LITERATURE.

Atmosphere.

FLEMMING. Ueber die Arten und die Verbreitung der lebensfähigen Mikroorganismen in der Atmosphäre. *Zeit. für Hygiene*, 1908, lviii, 345.

Disinfectants.

BLYTH (M. W.). Fleas and disinfectants. *Indian Med. Gaz.*, 1908, xliii, 92.

Disinfection.

FIRTH (Lieut.-Col. R. H.). Disinfection by formaldehyde. *Jour. Roy. Army Med. Corps*, 1908, x, 356. —SCHNEIDER (H.) and E. SELIGMANN. Studien zur Wertbestimmung chemischer Desinfektionsmittel. *Zeit. für Hygiene*, 1908, lviii, 413. —UYAMA and Others. Ueber die Schnell- und Massendesinfektionsmethode mit Formalin-Wasserdampf das Japanische Verfahren. *Zeit. für Hygiene*, 1908, lviii, 465.

Dust.

SMITH (E. S.). Street cleansing in relation to the growth of motor traffic. *Jour. Roy. Inst. of Pub. Health*, 1908, xvi, 206.

Dysentery.

ABE (N.). Ueber die aetiologie der dysenterie. *Arch. für Hygiene*, 1908, lxxv, 107.

Glanders.

BRUCE (H. W.) and H. H. RAYNER. Two cases of acute glanders. *Med. Chron.*, 1908, xv, 1.

Hospitals.

HOLMES (B.). A suggestive plan for a modern general metropolitan hospital of 500 beds. *Illustrations. Jour. Amer. Med. Assoc.*, 1908, l, 1025.

Hygiene.

BLACK (E.). Public health administration in Australasia. *Jour. Roy. Inst. of Pub. Health*, 1908, xvi, 231. —GOLDSTRAW (W.). Engineering and architecture in the promotion of public health by public bodies. *Jour. Roy. Inst. of Pub. Health*, 1908, xvi, 193. —LEISHMAN (Lieut.-Col. W. B.). International Congress of Hygiene, Berlin, September, 1907. *Jour. Roy. Army Med. Corps*, 1908, x, 393.

Immunity.

GOODMAN (H. M.). The duration and disappearance of passive diphtheric immunity. *Jour. of Infect. Dis.*, 1908, v, 184. —RICKETTS (H. T.) and L. GOMEZ. Studies in immunity in Rocky Mountain spotted fever. *Jour. Infect. Dis.*, 1908, v, 221. —STONE (W. J.) and E. C. L. MILLER. Theoretic considerations relative to immunization by means of the tubercle bacillus and its products. *Med. Rec.*, New York, 1908, lxxiii, 510.

Infant Feeding.

BURNET (J.). Some important points in connection with infant feeding. *Practitioner*, 1908, lxxx, 484. —LADD (M.). The caloric value of modified milk in its relation to infant feeding. *Arch. of Pediatrics*, 1908, xxv, 178. —TOWNSEND (C. W.). The use of fat-free milk in infant feeding. *Brit. Med. & Surg. Jour.*, 1908, clviii, 379.

Inoculation.

SANBORN (G. P.). The scope of therapeutic inoculation. *Brit. Med. & Surg. Jour.*, 1908, clviii, 484.

Malaria.

CELLI (A.). The campaign against malaria in Italy. Report to the fourteenth International Congress of Hygiene in Berlin. *Jour. Trop. Med.*, 1908, xi, 101.

Measles.

BUCHAN (J. J.). Preventive measures in measles. *Jour. Roy. Inst. of Pub. Health*, 1908, xvi, 214.

Meningitis, Cerebro-spinal.

DUNN (C. H.). The serum treatment of epidemic cerebro-spinal meningitis. *Boston Med. & Surg. Jour.*, 1908, clviii, 370.

Milk.

DELEPINE (S.). Pathogenic properties of, and amount of dirt contained in, the milk supplied to the town of Manchester during the ten years 1897 to 1906 inclusive. *Med. Chron.*, 1908, xiv, 473. —HASKELL (C. M.). A typhoid fever epidemic from infected milk. *Jour. Amer. Med. Assoc.*, 1908, l, 846. —ROSENAU (M. J.) and G. W. MCCOY. The germicidal property of milk. *Jour. Med. Research*, 1908, xviii, 165.

Mortality.

GAFFIKIN (P. E.). Some causes of infantile mortality. *Jour. Roy. Inst. of Pub. Health*, 1908, xvi, 220. —GETTY (S. E.). Infant mortality in the summer months. Methods adopted in Yonkers for its reduction and the results. *Jour. Amer. Med. Assoc.*, 1908, l, 1008.

Opsonins.

REYN (A.) and R. KYER-PETERSEN. Observations on the opsonins, with special regard to lupus vulgaris. *Lancet*, 1908, i, 919, 1000.

Plague.

HAFFKINE (W. M.). On the present methods of combating the plague. *Australas. Med. Gaz.*, 1908, xxviii, 74. —THOMPSON (J. A.). Protection of India from invasion by bubonic plague. *Australas. Med. Gaz.*, 1908, xxviii, 71. —WHERRY (W. B.), A. WALKER and E. H. HOWELL. Plague among rats in San Francisco. *Jour. Amer. Med. Assoc.*, 1908, l, 1165.

Poor Law Service.

BOYCE (J. W.). Some remarks on the Irish Poor Law Medical service. *Brit. Med. Jour.*, 1908, i, 852.

Scarlet Fever.

HENENWAY (H. B.). The scarlet fever epidemic of 1907. *Jour. Amer. Med. Assoc.*, 1908, l, 1115. —KERR (H.). Observations on the bacteriology of scarlet fever. *Lancet*, 1908, i, 995.

Schools.

JARRETT (E.). Health of our high school children. *Med. Rec., New York, 1908, lxxiii, 601.*

Serum.

BERGEY (D. H.). Factors determining the coagulation of blood serum by bacteria. *Jour. Med. Research, 1908, xviii, 31.*—CURRIE (J. R.). The serum disease in man after single and repeated doses. *Glasgow Med. Jour., 1908, lxi, 277.*—GOODMAN (H. M.). On the leucocytotoxins of normal serum. *Jour. of Infect. Dis., 1908, v, 173.*—McCoy (Capt. D.). Observations on the significance of the hæmolytic value of the blood serum. *Bio-Chem. Jour., 1908, iii, 97.*—PATON (D. M.). A new generalization in serum therapy. *Intercol. Med. Jour. of Australas., 1908, xiii, 79.*—STEINHARDT (E.) and E. J. BANZHAF. Is the present method of standardizing antidipteric serum according to antitoxin units therapeutically accurate? *Jour. Infect. Dis., 1908, v, 203.*

Tuberculosis.

ANDERSON (J. F.). The frequency of tubercle bacilli in the market milk of the city of Washington, D.C. *Jour. of Infect. Dis., 1908, v, 107.*—BERNBACH (P.). Blutuntersuchungen auf tuberkulose-immunkörper. *Zeit. für Tuberkulose, 1908, xii, 184.*—BROWN (L.) and E. G. POPE. The ultimate test of the sanatorium treatment of pulmonary tuberculosis and its application to the results obtained in the Adirondach Cottage Sanitarium. *Zeit. für Tuberkulose, 1908, xii, 206.*—LANDIS (H. R. M.). Agglutination studies in tuberculosis. *Jour. Med. Research, 1908, xviii, 19.*—MATHESON (Sir R.). The Dublin Tuberculosis Exhibition of 1907, and the lessons to be learned from it. *Dublin Jour. Med. Sci., 1908, cxv, 241.*—MILLER (J.). Note upon the tuberculo-opsonic index of the urine and sweat in health and in tuberculous disease. *Lancet, 1908, i, 998.*—WALKER (A.). The provision of sanatoria for the curative treatment of phthisis among the poorer classes. *Edinb. Med. Jour., 1908, xxiii, 321.*

Typhoid Fever.

BLUM (L.). A clinical lecture on the value of laboratory methods in the diagnosis of typhoid fever. *Med. Press, 1908, i, 340.*

Water.

REVAS (D.). Contribution to the differentiation of bacillus coli communis from allied species in drinking water. *Jour. Med. Research, 1908, xviii, 81.*

LAW REPORTS.**HIGH COURT OF JUSTICE.
KING'S BENCH DIVISION.**

February 11th, 1908.

BEFORE ALVERSTONE, L.C.J. A. T. LAWRENCE & SUTTON, JJ.

Sale of Food and Drugs Acts—Milk—Sample taken by Assistant Inspector—Proceedings by Inspector.

An inspector under the sale of Food & Drugs Acts, directed his assistant to procure a sample of milk in course of delivery, which he did. The inspector sent the sample for analysis, and instituted proceedings under the sale of Food & Drugs Act, 1879, Sec. 3. It was held that he was entitled to do so, although the assistant could himself have proceeded under the Act.

This was a case stated by justices of Middlesex, on the hearing of an information by Walter Tyler, an inspector of weights and measures, and also an inspector under the Sale of Food and Drugs Acts,

for the county of Middlesex. The information alleged that he did procure at the place of delivery a certain sample of milk in course of delivery by the Dairy Supply Co., Limited, to the guardians of the poor of the Brentford Union, the purchasers or consignees in pursuance of a contract for the sale to the said guardians of the Brentford Union, such purchasers or consignees of such milk, and that suspecting the same to have been sold by the respondents contrary to the provisions of the Sale of Food and Drugs Acts 1875 to 1899, the appellant did submit the same to be analysed by the public analyst, when the same was found to have been unlawfully sold by the respondents, contrary to the provisions of the said Sale of Food and Drugs Acts, inasmuch as it had been deprived of fat to the extent of 9 per cent., without disclosure having been previously made of such alteration. The sample in question was taken by one Anderson, an assistant inspector of weights and measures for Middlesex, on Tyler's instructions, but Tyler was not present. Tyler sent the sample to be analysed and instituted proceedings under the Sale of Food and Drugs Amendment Act, 1879, Sec. 3, which is as follows.—“Any medical officer of health, inspector of nuisances, or inspector of weights and measures, or any inspector of a market, or any police constable under the direction, and at the cost of the local authority appointing such officer, inspector, or constable, or charged with the execution of this Act, may procure at the place of delivery any sample of any milk in course of delivery to the purchaser or consignee in pursuance of any contract for the sale to such purchaser or consignee of such milk; and such officer, inspector, or constable, if he suspect the same to have been sold contrary to any of the provisions of the principal Act, shall submit the same to be analysed, and the same shall be analysed, and proceedings shall be taken, and penalties on conviction be enforced in like manner in all respects as if such officer, inspector, or constable had purchased the same from the seller or consignor under Section 13 of the principal Act.”

It was contended on behalf of the Dairy Company, that as the sample was actually taken by Anderson, a duly qualified, though an assistant inspector, the proceedings ought to have been taken by him. The justices being in doubt dismissed the information.

Eustace Hills appeared for the appellant, Arory K.C., and Clarke Hall for the respondent. The court allowed the appeal.

Lord Alverstone in the course of his judgment said that an inspector could procure a sample under Section 3 of the Act of 1879, by a proper agent. It had been held in *Horner v. Scott*, 5 Q. B.D. 552, that an officer might act by deputy in taking samples under Section 13 of the Act of 1875, and there seemed no reason why that decision should not apply to this case. Anderson here took the sample as agent for Tyler, and as Tyler sent it for analysis he was the proper person to take proceedings. The appeal was therefore allowed.

A. T. Lawrence and Sutton, JJ., agreed.
[For full report see 72 J.P. 132].

Public Health

THE JOURNAL OF THE

Incorporated Society of Medical Officers of Health.

No. 4.

JUNE, 1908.

VOL. XXI.

THE DEATH OF DR. WOODFORDE.

IN the early morning of April 25th, Dr. William Thomas Garrett Woodforde peacefully passed away at his residence, “Oakbank,” Spencer's Wood, near Reading, within a month of having completed his 82nd year. Born at Kingsland on May 26th, 1826, he was the son of a medical practitioner and had two brothers and three sons in the profession. He received his medical education at University College, London; graduated M.B. London University in 1848; and obtained the M.D. degree in 1852. He was formerly Medical Officer of Health and Public Analyst of Poplar. His “North Poplar Sanitary Reports” dated from 1865 to 1873. In the last-named year he was appointed Medical Officer of Health of the Berkshire Combined Sanitary District, and he actively carried out the duties of that office to within a few days of his death. At one time during that period he held the appointment of Public Analyst for the Borough of Newbury.

His was one of the original appointments made after the passing of the Public Health Act, 1872, which first imposed the duty of appointing medical officers of health upon local authorities in all parts of England and Wales outside the metropolis, and he held the post uninterruptedly for thirty-five years.

Dr. Woodforde was a Vice-President of the Society of Medical Officers of Health in 1870-71; President of the Society 1893-4; President of the Home Counties Branch 1897-8; President of the Reading Branch of the British Medical Association in 1882 and 1883. He held the office of medical officer of health from 1865, and at the Jubilee Banquet of the Society on May 11th, 1906, at which, fortunately, he was present, Sir James Crichton-Browne, in proposing the toast of the “Society of Medical Officers of Health and its Jubilee” referred to him as the father of the Society.

The subject of his Presidential Address to the Society of Medical Officers of Health, was “The Local Government Bill,” and of his Presidential Address to the Home Counties Branch, “Amendments required in the Notification Act.” He invited a discussion on that address, and at an adjournment of it at a subsequent meeting several resolutions were passed, amongst them being one that the time had then arrived for the Act to be made compulsory, which were sent to the Council of the Society.

In 1898 he was appointed on a committee of the Home Counties Branch, which was formed for the purpose of taking steps to promote uniformity in classification of diarrhoea deaths, upon which he did very valuable work. That committee, after an exhaustive inquiry, made two reports to the Branch in April, 1899 and May, 1900 respectively. Acting on the recommendation of the Branch, the Council of the Society communicated with the Royal College of Physicians with a view to their appointing a committee to deal with the question. The College appointed a committee, who issued a very valuable report, in which they recognised the specific character of the disease generally termed “diarrhoea,” assigned a definite name to it and urged the entire disuse of its numerous synonyms. That report having been unanimously adopted by the College, there is now an official name for the disease which should be always used in certificates of deaths therefrom, to the exclusion of all indefinite synonyms. Thus, Dr. Woodforde's efforts contributed in no small degree to the evolution of order out of the chaos in which the certification and classification of “diarrhoea” deaths had previously been involved.

In 1904 he took part in the compilation of some modified building byelaws suggested for adoption in rural districts which were approved by the Home Counties Branch, and submitted to the Council of the Society. That Council

appointed a committee to deal with the subject, of which he was a member, but no definite conclusion in respect of the matter has been arrived at.

Throughout his exceptionally long tenure of office, by virtue of his ripe experience, great energy and assiduity, he was instrumental in effecting an immense amount of good in his very extensive district, in which he was everywhere held in high esteem. A man of many parts, a thorough musician, a devoted lover of flowers and gardening, and of everything connected with literature and art. He led a quiet, peaceful life, in the midst of the beauties of nature he loved so well. His was a singularly happy temperament, he was ever bright and cheerful, and so he remained up to the last day of his life, retaining all his faculties unimpaired to the end, and keeping well abreast of the most advanced knowledge of his branch of the profession.

For very many years he gave his services as organist of Grazely Church, and he was churchwarden for upwards of a quarter-of-a-century. And now at a ripe old age has ended a strenuous and exemplary life, full of work, well and conscientiously done, for the public good. His loss to his family and parish will be very great; he will be sorely missed by them, and in every part of his wide district, especially by the writer of this notice, who was intimately associated with him in his professional work, and thus learned to appreciate his great worth and sound judgment.

The interment took place in the family grave in the City of London Cemetery, Little Ilford, on Friday, May 1st, at which the Society of Medical Officers of Health was represented by Dr. Sanders, of West Ham, Dr. Sowden, of East Ham, Dr. Gerard Charles Taylor, Medical Officer of Health of the Berkshire County Council, and Mr. Alfred Ashby, of Reading. There were many beautiful wreaths of flowers; amongst the senders being the President and Council of the Society of Medical Officers of Health, the Home Counties Branch of that Society, and the Oxford and Reading Branch of the British Medical Association. ALFRED ASHBY.

THE PRESENT POSITION OF THE MEDICAL OFFICER OF HEALTH.

THE growing interest of the public in the progress of preventive medicine has found expression in the tendency of Parliament to pass measures that add to the onerous duties that devolve upon the medical officer of health. It has now become exceptional for a Parliamentary session to close without having produced legislation of

this kind. The present session promises to be no exception to this rule, for the Housing Bill contains provisions which will materially increase the responsibilities of medical officers of health. All this of course is satisfactory. It is evidence of increasing public confidence in the medical officer of health, and of an increasing recognition of the value of his work. But we fear that there is still an inadequate appreciation of the difficulties under which that work is done. The medical officer of health, by the nature of his occupation, is constantly being brought into direct conflict with powerful vested interests, which are usually able to command considerable influence on the local authorities by whom he is employed.

Here it might be thought is a case where special precautions are necessary to ensure that an officer charged with duties so vitally important to the public welfare should be afforded some assurance that the due performance of those duties shall not bring upon him an official quietus. But instead of receiving such a safeguard, he is usually subject to a system of re-election that might have been specially designed to add to the difficulties of his position. The result has been detrimental to the medical officer of health, but it has been infinitely more detrimental to the public.

At the present time there appears to be some hope that matters may be placed on a more satisfactory basis. A long series of valuable reports of the Local Government Board has revealed to the public the important fact that in a large number of districts sanitary administration has been practically set aside by the sanitary authorities. But though these reports have proved much that is to the discredit of sanitary authorities, they have also shown that in many even of the most backward districts the medical officer of health has not been wanting in zeal or ability, and that he has made the best fight he could for the health of his district. We venture to think that the medical officer of health comes out of these reports with a creditable record. But the system under which he is appointed is radically bad, and until that system is altered, the public will lose much of the benefits of sanitary legislation. The introduction of the Housing Bill has afforded an opportunity for effecting changes in the position of the medical officer of health for which we believe public opinion is now ripe, and medical officers of health must look to it that the opportunity is not wasted.

GARDEN CITY, RURAL HOUSING, AND THE GOVERNMENT.*

By F. E. FREMANTLE, Esq., M.B., M.Ch., M.R.C.P., F.R.C.S., Herts County Medical Officer of Health.

MOTTO.—"And therefore it may seem that the first founder of the citie minded nothing so much as these gardens. For they saye that King Utopus him selfe, even at the first beginning, appointed and drew furth the platte fourme of the citie into this fashion and figure that it hath nowe, but the gallant garnishinge, and the beautiful settinge furth of it, whereunto he sawe that one manne's age would not suffice: That he left to his posteritie."—SIR T. MORE'S *Utopia*, A.D. 1516.

TOWN PLANNING.

AN industrial city of 30,000 inhabitants is in the making—an experiment in housing and town planning on reasoned principles. Go and see it; read of it; watch its growth. It is the first Garden City at Letchworth, near Hitchin, in Herts, the first child of the Garden City Association. Modern industry is being set in ideal surroundings, providing a market for the agricultural industry around it. The country is being repopulated; overcrowding somewhere is being reduced. The commercial and social advantages of the town are here being combined with the physical and moral advantages of the country in a scheme, planned and guided in its growth with a view to its ultimate completion, on land at a natural price, put to its natural use, owned by those who use it. The rentals go to keep the rates down to three shillings. A dozen factories, 47 shops, 58 societies, a population of 6,000, and an increased value of £120,000 on the £250,000 laid out during the last four years, testify to the reality of the experiment.

The idea of town planning dates back at least to Sir T. More's "Utopia," and to Sir Christopher Wren's elaborate plan for rebuilding the City of London after the great fire. Richard Owen, Pemberton, Buckingham, were but the precursors of Mr. Ebenezer Howard, whose shilling "Garden Cities of To-morrow," in 1898, started a movement likely to be of epochal importance in the history of civilization. Prevention of ills in new towns, as they grow, is better than patchwork in old. The principle of town planning is obvious in Adelaide and in the Malay States, in Manchurian Dalny, in Washington, in Boston, in Vienna, in Essen. Sweden, in 1874, and most European countries since, have established the

* Condensed for publication.

principle on their statute books. The need is advocated by branches of the Garden City Association in France, Germany, Holland, and elsewhere abroad. It is urgently required for Hong Kong and for Winnipeg. It has taken shape in a dozen schemes for garden cities and villages in this country. It is urgent for the new naval base at Rosyth. "*Crede viatori.*"

In what way, then, does the Government Bill, introduced by Mr. Burns, secure this proper town planning of our population and extension of existing towns? The Local Government Board are to be enabled to draw up a set of general provisions, which will practically extend the building bye-laws, with a view to the minimum requirements of town planning as to health, traffic, and perhaps æsthetics and freedom from fire, and will prescribe the procedure to be followed. A town planning scheme may, and if so ordered by the Local Government Board, must, be adopted by any borough, urban or rural district council or councils, or in London by the London County Council only, for the whole or part of their districts. Such a scheme has to be approved by the Local Government Board, which may hold a local inquiry for the purpose, and special provisions are to be added in each case to the general provisions according to local needs. The principles of worsement and betterment are adopted, the authority paying the first and recovering the last, the question and the amount being determined by the Local Government Board. For the execution of the scheme the local authority may purchase land by agreement, or be authorised to do so as for Part III of the principal (1890) Act. Finally, where the authority fails to take requisite steps, the Board may step in and order steps to be taken, enforcing their order by mandamus.

It will be seen that the whole force of this measure depends upon the general provisions that are to be drawn up by the Local Government Board to deal with a very wide and definitely prescribed list of subjects; and the carrying out of the Act depends in every clause on the sanction and limitations of the Local Government Board. It is, in fact, a thoroughly bureaucratic measure, cunningly devised to squeeze itself through the mesh of the Parliamentary net, and not in itself going further than the foregoing considerations warrant.

In one essential, however, it fails. It seeks to give effect to a principle which should take effect wherever building may go on, that is,

throughout the length and breadth of the land ; and yet it does this entirely by the action of the Local Government Board and of the borough and district councils. Are these councils bodies of sufficient standing for the purpose? Are their officers in a position, and have they the experience requisite for advising upon so intricate and so delicate a problem? Does the scheme provide for "linear extension," which is the modern method of urban development and permeation of the country? Have the Local Government Board the necessary staff and opportunity for keeping in such intimate touch with every remote corner of the country as to know the bearing of local conditions on the future extension of every town and village? At the end of this paper we will answer this question in the decided negative and will give reasons, corroborated by the proposals already discussed, for a clear definition of authority, with the county council as the sole link in the chain connecting Whitehall above it with the District Council below, and for the establishment of a medical and subordinate sanitary service on the security of the State and on an adequate footing.

RURAL HOUSING.

Our subject now takes us on to more familiar ground—familiar for the past half century in hygienics, in politics, and in literature alike. It is to the early social reformers and to the noble band of Christian Socialists of half a century ago that we mainly owe the modern campaign on behalf of good houses for the working classes ; and the inspiration of Charles Kingsley's Sanitary and Social Essays and his account of the '54 cholera epidemic in a Devonshire village in "Two Years Ago," are still unrivalled in sanitary writings. The following more modern episode illustrates well the inadequacy of rural housing conditions as at present subsisting. It will form a useful peg—or rather hat-stand—on which to hang the several heads of this most complicated and not unimportant problem.

The scene of this episode is the hamlet of Chipperfield, in the parish of King's Langley, in the rural district of Hemel Hempstead, on the western or Bucks border of the county of Hertford. The corporate *dramatis personae* are the respective Parish, District and County Councils. The period of the episode extends from January, 1904, to May, 1907. The legal

background is the provision in "The Housing of the Working Classes Act, 1900," Section 6, that "if a *Parish* Council shall resolve that a *Rural District* Council ought to have taken steps for the adoption of Part III of the principal Act" that of 1890 "and have failed to do so, the *County* Council may, if satisfied after due inquiry that the District Council have so failed, resolve that the powers of the District Council for the purposes of that part of the Act shall be transferred to the County Council with respect to the parish, and they shall be transferred accordingly." These powers are to erect dwelling or lodging-houses for the working classes where required, at the expense of the District Council.

In January, 1904, the King's Langley Parish Council first, under the Act of 1900, petitioned the District Council to remedy the want of cottages in Chipperfield under the Act of 1890. Inquiry by two independent committees, by the district medical officer of health, and by the newly appointed sanitary inspector, revealed many sanitary conditions, which were set right in 1905, although old cottages could not be brought up to modern standards of construction. All were occupied, but nineteen out of seventy-nine tenants worked out of Chipperfield. Did this constitute a dearth of accommodation, calling for action under Part III of the Act? The Parish Council resolved so ; the District Council disagreed ; and by mutual consent an appeal was made to the County Council on December 6th, 1905.

The County Council appointed a small committee, and a local inquiry was held at King's Langley on November 15th, 1906, and at Chipperfield on November 28th, 1906, at 6 p.m. Between these two dates, the county surveyor and county medical officer of health were requested to investigate and report ; every cottage was examined in detail, and a full account printed. The condition was fairly typical of common rural conditions at their best.

Of eighty cottages scheduled as coming within the category of houses for the working classes, I personally examined fifty-five, omitting many of those known to be satisfactory. The cottages were all habitable according to the legal standard, although several conditions usual to old houses would not be allowed in new, such as defective height of rooms, window area, and absence of damp course. In respect of sanitary provision and condition of backyards, the main defects had been remedied, or

were on the way to be remedied. As to overcrowding, I found no actual instance of insufficiency, according to the minimum requirements, and most of the rooms seemed in the day-time to be tolerably well ventilated. Inadequacy of window-area was, however, very common, and this plays an important part in ventilation. I found no cottage with more than two bedrooms, and such provision, both on sanitary and moral grounds, becomes increasingly inadequate as the children grow up. The rent of most cottages had been raised 2d. a week since the water had been laid on ; but the cottagers seemed to consider this and other recent increases in rent reasonable. The rent paid for seventy-four cottages, varying from 1s. 6d. to 5s. 6d., averages 3s. 1½d. weekly.

Of fifty-five occupiers, ten were employed outside Chipperfield, but I had no evidence as to the employment of other adults in these families. The population of Chipperfield in 1881 was 493, there being in that year 126 houses ; now there were 130 houses. It is probable that the population is increasing by four or five every year, even allowing for the natural tendency of young adults towards the towns.

As the present accommodation was barely sufficient for the present number of inmates at their present age, and as most of the existing cottages were of considerable age, it was evident that either (a) new cheap cottages must be built, or that (b) those at present being brought up in cheap cottages must move, when they grow older, to the more expensive cottages, of which there is no dearth ; or (c) that the village must be gradually deprived, by migration elsewhere, of the younger generation of the labouring classes resident in Chipperfield. I found no evidence, however, that those of the present generation would move into new cottages, unless provided at a rate considerably below that of the cottages to which they have grown used.

The county surveyor's report endorsed these remarks, and estimated the cost of erecting ten cottages in a row at £180 or in pairs at £189 apiece.

The inquiries attracted much local interest, and were well attended. The evidence has been printed in full at the expense of the County Council, in recognition of the importance of the case for the County and Country. I have a few spare copies for distribution.

The committee reported to the health committee of the County Council on December

17th, 1906. They exonerated both District and Parish Council of all blame. In considering whether the former were in default in not adopting Part III. of the 1890 Act, they were of opinion that the question turned on the sufficiency of the accommodation, and they found that the working classes had difficulty to a substantial extent in finding such accommodation. They recommended a tentative measure in the erection of ten cottages in pairs at a total cost, including land, of £1,890, estimated by the county surveyor as follows :—

ESTIMATED COST OF ERECTION OF A PAIR OF LABOURERS' COTTAGES.

	£	s.	d.
Building	322	14	7
Land (half-an-acre)	20	0	0
New road (part of), say	10	0	0
Fences	15	0	0
Drainage, if part of combined system	10	0	0

Total cost of a pair of cottages ... £377 14 7

That is, £189 per cottage, including all costs.

The annual cost of such a scheme (supposing ten such cottages were erected and let at a rent of 3s. per week) would work out as follows :—

ANNUAL COST OF TEN COTTAGES ERECTED IN PAIRS.

By loan of £1,890 for 60 years (£100 for land for 80 years) at 3½ per cent.

	£	s.	d.
Annual repayment of principal (4s. 9½d. for land)	9	7	1½
Annual payment of interest	66	3	0
Total annual charge in respect of loan	75	10	1½
Repairs and empties, one-sixth gross rental plus contribution from rates, i.e., £182 ÷ 6	30	6	8
Rates at 5s. 6d. on rateable value, i.e., £55 14s. 4d., being two- sevenths less than gross value	15	6	7
Water at 1s. per £1 on gross rental per year, i.e., £78	3	18	0
Property tax at 1s. in the £1 on actual gross value, less one- sixth, i.e., £65	3	5	0
Insurance at 1s. 6d. on £1,890	1	8	5
Commission for rent collecting at 2½ per cent. on £78	1	19	0
	131	13	9½

Less Incomings—

10 at 3s. per week for 52 weeks ... 78 0 0

Total charge on rates ... 53 13 9½

In King's Langley parish a penny rate produces £42. An annual rate of 1·27d. in the pound must be charged, or with cottages let at 3s. 6d. a rate of about 1d. To meet the cost out of the rents would require a weekly rental of 5s.

On January 23rd, 1907, the County Council accepted the report. Here, it seemed, was the very condition for which the Act was passed, and it seemed right that the Council should try its value on this, the first opportunity they have had of putting it in force. The proposal would probably have been carried out; but a slip occurred 'twixt cup and lip.

The original appeal of the Parish to the County Council was not in accordance with the resolution required by Part III, Section 6, of the Act. The Parish Council were therefore requested to pass the necessary resolution.

Meanwhile, however, a new Parish Council had been elected; the election had been fought with great keenness on this sole question, and the reformers had been defeated. Instead of passing the necessary resolution, enabling the County Council to build cottages at the expense of the rates, a contrary resolution was carried by nine votes to one. The County Council, therefore, has no power to act in the matter, and, in so far as Hertfordshire is concerned, the Act is a dead letter.

This is the parable of Chipperfield. Let us consider its interpretation and moral.

1. THE STATE OF EXISTING RURAL COTTAGES is seldom better than at Chipperfield; they are built with the same defects; they frequently show far more neglect and decay. At their best, what is wrong with the Chipperfield cottages?

- (a) *Air Space* is defective for a minimum allowance of 400 cubic feet per head over, and 200 under ten years of age.
- (b) *Ventilation* is largely a matter of habit and education; but sash-windows the poor prefer and may open for a chink at night; casement-windows they will open never, except perchance by day.
- (c) *Inadequate Window-Area* is universal and affects ventilation, cleanliness, and the salutary action of light.
- (d) *Two Bedrooms* are insufficient for a growing family and a peril to morality and health. No houses of this class should be built with less than three bedrooms. If unoccupied, it is easy to find a lodger or other use for the third room.
- (e) *Dampness* is the rule and due to a general absence of damp-course, concreted basement, ventilation under the floor, and to an ill-chosen site.

(f) *Most other conceivable defects* of construction have been devised by the ignorant ingenuity of local builders; and privies, refuse-middens, leaking drains, defective gullies and traps, roofs and paving, all on a defective site are common.

(g) *Overcrowding on Site* in villages, as in towns, is the rule and not the exception. Even by the model rural bye-laws, forty to fifty may be built on an acre; whereas the Garden City has a maximum of twelve, and certain places abroad have a limit of eight to the acre.

So much for Chipperfield cottages at their best. But cottages are never kept long at their best. The machinery of management is constantly at fault; and picturesque decay is the note of every village scene. For illustration it is enough to turn over the leaves of any County Medical Officer's Annual Report. Thus, in Lancashire, for 1906, "Many are quite unfit for habitation . . . The most insanitary cottages are found in the rural districts." For the West Riding "in almost every district there exist insanitary dwellings which call for improvement on the most elementary lines of reform." It is a truism to cite the reports of medical inspectors to the Local Government Board, in which attention is invariably called to the state of cottage accommodation.

2. ADEQUACY OF HOUSING.—The accommodation in Chipperfield, for the present number of inmates at their present age, was barely sufficient. This experience, too, is fairly universal. How could it be otherwise? With the small margin of profit available in a country neighbourhood, who is going willingly to run the chance of having a cottage untenanted on his hands? Surely, supply must closely depend upon demand; surely, seeing that cottages, like men, exist in different stages of life, and that, unlike men, the oldest are, *caeteris paribus*, the cheapest, it is the oldest house that will always be sure of a tenant; if any are vacant, it will be those at the top of the scale. This we see in Chipperfield. There were a few new cottages of higher rental vacant. These had been erected in response to the general ulterior demand of any community, dependent on the limited life of a house. Sooner or later they will be tenanted, but by whom? By outsiders, perhaps. But exclude outsiders, as in most villages you well may. Then by the rising generation from the more thrifty tenants of the poorer

cottages. As cottages die out, their tenants are taken in to those that are left, until the rising generation marry and the older die, and in the change some of the rising ones take a step up in the little village world. So we have a population shifting gradually upwards in house accommodation, as the house accommodation is constantly depreciating, shifting downwards. This principle—I may, perhaps, be allowed to coin for it a title, the principle of house-degradation—is but little apparent in a village, but it is obvious in many towns—it is a vital factor in the history of our great cities. A row of workmen's cottages is built on the outskirts of a small town, and is tenanted by prosperous artisans. Repairs are undertaken in varying degree, but seldom with sufficient generosity to maintain the standard of the houses. The houses grow old and unattractive; as is the house so is the tenant; a single neglected house attracts or corresponds to a slovenly inmate. The more respectable neighbours long to move on, and the once prosperous little "Paradise Row" becomes the paradox that is a commonplace in street-nomenclature. The rents fall; it is spoken of as a slum, and furnishes at the same time a text for the reformer, a label for a separate file in the local health offices, and a most convenient refuge for those who are in straits to keep outside the workhouse. Let us never be alarmed on this head. The natural housing of the working classes is, and always will be, in houses that have seen better days. However perfect our administration, we shall always find in every locality a proportion of moribund houses, and always a full use to overflowing, or to the legal limit of the poorer class of house property. Vacant or half-occupied cottages should be available, and can only be available, at the 4s. to 6s. rental in order that they in fifty years' time may be good enough for the requirements of those who can only pay 2s. to 3s. in rent. It is absurd to expect that the labourer will pay the large percentage necessary for fresh paint and newness, and although we may wish and hope that he will appreciate dryness and sanitary perfection, the community will always have to thrust them upon him; and, in so far as they thrust them upon him, it is only fair that the community should bear the expense. It is through failure to recognise this principle of house degradation that there is difficulty in accepting the reports of deficiency in house accommodation in many public utterances.

But of this we may be certain: firstly, that in the 1901 census 8.1 per cent. of the population were living in overcrowded rooms, and if overcrowding is to be corrected, fresh accommodation must be provided; secondly, that closure orders are often avoided because of the lack of alternative accommodation; and thirdly, that out of 5,000,000 houses at rental under £15 per annum, only one-ninth of 1 per cent. per annum are reported unfit for habitation, which is equivalent to saying that the average life of such a house is 900 years. If, then, we are to correct such palpable anomalies, there is urgent need, for the present distress, of abundant further provision of houses for the working classes both in town and country.

3. EFFICACY OF ADMINISTRATION.—Chipperfield, in 1906, showed the correction to a certain point of a state of affairs existing in 1904, which had been induced by a lethargic administration. The officers, fortunately, were fearless, and had no great cause for fear. But rural administration is sadly inefficient, and this for causes well known to this Society. The moiety of salary paid to sanitary officials by the county councils has enabled the Local Government Board to press for reforms. But most of the officials are, by nature of their appointments, tongue-tied. For this reason statistics are inapplicable, but instances are innumerable. We will give three as types.

- (a) In a recent report (No. 277) of a medical inspector to the Board, the medical officer of health, being in private practice, had deliberately failed to deal with notifications of infectious disease, and the rural council had expressed their deliberate satisfaction at the fact.
- (b) At Southend the outspoken medical officer of health collided with private interests, and a reduction of salary secured his resignation.
- (c) In a small suburban town, his private practice did not prevent the medical officer of health from reporting the decadent state of cottage property, owned by members of the council. His re-election was annually challenged. Other officials were also harrassed. Like the unjust steward, he took counsel with himself what he should do. Deliberately, and with private intimation to his county medical officer of health, he omitted "housing" from his annual report. The council commended

the unjust medical officer of health because he had done wisely, and referred his application for increased salary to the consideration of a committee.

There is no need for inquiry. The facts are obvious. A small council is swayed by a single man. Councillors are often house agents or owners, farmers or butchers. They cannot, even with the best intentions, consider the relations of their property to the public health without bias. Clerks, too, are often solicitors and agents for owners of property; and a recent inquiry by the Rural District Councils' Association showed that, of 445 councils replying, 303 had medical officers of health in private practice, while 108 shared the services of their medical officers of health with each other, and only thirty-four employed the whole-time services of a medical officer of health. "No man can serve two masters," still less a large private *clientèle* as well as a public body. Even a Local Government Board inspector has failed for this reason to obtain from the sanitary inspector the information he required as to the most insanitary areas of a district he was inspecting. The position is untenable; the strain on the conscience is constant and excessive; the result is a withering of ideals and a fettering of real progress.

The area of administration, in fact, is too small. In a larger council public opinion defines itself clearly, experience is wider, councillors specialize and are more expert. Officers can be engaged for their whole time, with staffs and assistants under them, having a larger scope of employment and the healthy stimulus of an organized department. The future of the public health, as of education, lies in county government, with the help of local committees.

4. THE IDEAL COTTAGE.—In preparing, then, a scheme of improved house accommodation, it is necessary to formulate our ideal. It has been remarked that the true and natural supply of cottage property would consist in the provision of houses for the more prosperous artisans, such as may by fifty years' gradual degradation be reduced to the level of the labourers' purse. But sanitary reform moves rapidly and will not wait fifty years. We want to distribute our overcrowded population, to demolish uninhabitable houses, and declare tens of thousands uninhabitable that finished their natural course of life long ago. For this

present distress, therefore, we want a labourer's cottage, one that is as cheap to erect as is consistent with durability and good health. Certain requirements are expressed and should be universally enforced by bye-laws, whereas half the Rural Districts in the country have none. As in the 1903 model of the Board, these may rightly be limited to matters of sanitation; but certain further points should be required. Inferior material should be restricted. Roofing and site should be under control. A mere 150 feet open space in rear is absurd; and if the absence of sewers makes home-disposal of slop waters advisable, a quarter of an acre should be a minimum. Above all, the bye-laws should be elastic, regulated and adapted by the County Council rather than the Local Government Board.

Garden City at Letchworth provides an unique field again for housing experiments, and public attention was attracted by the "Cheap Cottage Exhibitions" of 1905, when it was proved that at Letchworth, where the price of brick and cement is low, without charge for ground, builder's profit, or architect's fee, a landlord could build a three-roomed cottage, under rural bye-laws, for £150. The chief housing problem, however, in rural counties is for districts rapidly becoming urban. Last year, therefore, an exhibition was held of urban cottages costing from £175 to £240 each, with a subsidiary exhibit of homesteads for small holdings, costing from £250 to £300, with the necessary outhouses. The judges, an independent body, including Dr. Sykes of our Society, congratulated the promoters on their Exhibition, and in their criticism dwelt mainly on the unsuitability of many cottages to the needs of the labouring classes, and on the undue elaboration of roofs at the expense of wall space and bedroom height.

In the matter of public health these cottages at their best leave little to be desired. Three points may be mentioned:—

- (a) The typical house must contain three bedrooms.
- (b) Every bedroom should have a fireplace, with cut-away sides and sloping backs, and some means should be found for utilizing waste heat escaping up the chimney.
- (c) The problem of economic and comfortable ventilation still remains to be solved for the living, but still more for

the bedrooms. Double-sash windows are practically an essential. They are never carried, as they should be, right up to the ceiling, and the occasional ventilators were often to be opened only by knobs out of reach; whereas ventilation should be the rule, should be more evenly distributed over a room, and should be unnoticeable, lest it be blocked up once and for all.

On this estimate for building, variable as it must be, according to locality, several variants have been tried. The 1905 Exhibition showed eighteen different kinds of material used for the outside walls; and the average cost of municipal cottages has been said, in consequence of the exhibition, to have been reduced by 20 per cent., but none appear to have been erected to include three bedrooms for less than £150, and, considering the local cheapness of building-material, more must be added for corresponding houses elsewhere.

Moreover, the general impression of these garden city cottages is not that of material sufficiently solid and seasoned to last. So we come back to our Chipperfield estimate of £189, including everything, with £20 for land.

5. SUPPLY OF ADEQUATE HOUSING.—This brings us to the means of securing the necessary cottages. The real difficulty is due to the depression of agriculture, which prevents an increase of wages, and to the costly requirements of sanitation and decency, as expressed in modern bye-laws and custom. We cannot, however, go back to former conditions; we must take as axioms the dictates of our civilisation. If these cottages cannot be built, for instance, at Chipperfield, for less than £189 apiece, and if the labourer cannot afford to pay more than three shillings a week, the rates must be for ever burdened to the extent of a penny or two in the pound to build him his necessary house.

On this it is well to quote Dr. Plehn's standard work on public finance as to the relationship between individual and State:—

"It is impossible to approve on *a priori* grounds of every intrusion of the State into fields hitherto set aside for the individual; only when such intrusion does not lessen individual power, energy, ambition, and ability to advance, is it permitted, and only when it promises definitely to increase the importance of the individual in the long run, is it desirable.

"The provision of houses by the State, a function which comes directly within the scope of individual effort, embodies a communistic principle of a sectional character, and in operation entails a huge loss to the community at large which could be avoided if individuals, vested by the State with special rights and privileges (*i.e.* large landowners) did their duty."

At the same time it has already been suggested that, to provide the labourer with new sanitary cottages is to give him something he does not appreciate, and cannot be expected to pay for; a certain proportion of the cost, representing this recent enthusiasm of the community, may fairly be charged on the public purse, when other sources fail.

There are, then, three other courses open to us in seeking to put the erection of cottages on a sound financial basis, viz.:—

- (a) To raise the rent;
- (b) To reduce the capital cost;
- (c) To reduce the annual charges.

(a) To raise the rent would seem impossible. But the difficulty has been met this way by a Buckinghamshire land-owner, who thereby obtained for the men a corresponding increase of wages from the farmers. The farmers had reason to stand well with him; some of them secured, perhaps, some modification of terms on which they held their farms from him; and the effect of higher rents has been to stimulate private enterprise in cottage-building in the neighbourhood. If the prospects of agriculture were to improve, if the quality of the labourer were to improve as the quality of the mechanic in the towns has improved, then the labourer would no doubt share in the advance of wages which is experienced in the towns. It is noticeable that as yet no attempt at the trade organisation of agricultural labour has succeeded. But it must also be borne in mind that wages vary very largely in different counties; and that cash wages are often considerably increased by allowances in kind. Thus, in a table issued in his second report, by Mr. Wilson Fox, Controller-General of the Labour Department of the Board of Trade, the average cash earnings of agricultural labourers vary from 11s. 11d. in Dorset, and 12s. in Oxfordshire, to 19s. 4d. in Northumberland, and 20s. in Durham. But there is an average allowance in kind estimated in the same counties respectively at 3s. 7d., 2s. 6d., 2s. 3d., and 2s. 2d. Average net wages, therefore, vary between 14s. 6d. in

Oxfordshire and 22s. 2d. in Durham. But small holdings and the attachment of lands or allotments to the cottages may, with suitable instruction and advice, become a means of raising the rent.

(b) To reduce the capital cost of the cottages is, in the light of the Garden City Exhibitions and general recent experience, as a rule impossible. Comfortable cottages could be erected at a reduced cost by the use of timber; but it would seem probable that upkeep would cost more and the life of the cottages would be considerably less. Under special circumstances, however, the use of local material may make a substantial reduction of the original cost. At Winterslow, close to Salisbury, some fifteen years ago, Major Poore advanced a sum of £1,500, and initiated his well-known scheme, which has cost him nothing, and has led to the formation of a company of working men and the building of some forty cottages by the freeholders themselves. The local chalk is used for building, mixed with straw and trodden into a paste, and the cost of a cottage varies from £100 to £130, according to whether it contains three or four bedrooms.

(c) To reduce the annual charges is perhaps the most generally feasible method of making the two ends meet. On new and sanitary houses for the working classes property tax might be remitted or rates might be reduced. This in either case is equivalent to direct support from the community and the relief of the individual. On the other hand, the loan period might well be extended to the seventy or eighty years, which may be set down as the minimum life of a well-built cottage. But, in the end, it would probably be better to advance a certain proportion of the cost of building suitable cottages to trustworthy persons prepared to build, than for the public authority, however large, to undertake the building itself. At any rate, the need is great and must be met, and it must for a time be assisted by the public funds. That for this purpose the existing machinery is inadequate is shown by the fact that Part III of the 1890 Act appears, since that date, only to have been actually adopted in eleven parishes out of thirty-one for which applications for sanction to adopt were made, action being only in one case—Usworth, in Durham—actually taken by the parish and county councils under Section 6 of the 1900 Act, and in that case still awaiting

the sanction of the Local Government Board. In fact, from the point of view of supply of houses for the working classes, both 1890 and 1900 Acts are a failure.

6. MAINTENANCE BY EFFICIENT ADMINISTRATION.—To maintain an equilibrium of sound housing, it is necessary to make the most of existing houses, to have a clear definition of the uninhabitable house, to know without dispute when a house has ended its days, and then forthwith to demolish it or convert it to other uses. We want a complete sanitary survey, corrected by an annual declaration from owners of property, as in general force on the Continent and recommended by the late Duke of Devonshire's Royal Commission on Labour and by Sir John Dickson-Poynder's Select Committee in 1906. But cheap cottages and bye-laws, improved terms of loan and amplification of official powers are all but of secondary importance. Attention must be focussed on the authority and its officers. They are the kernel of housing reform. Until they are reformed, reform of the housing law is useless.

7. PRACTICAL UTOPIA.—The medical officer of health must be a whole-time officer in every district throughout the land. Is it possible to effect this by a compulsory combination of districts for the purpose? Even if it were, is the system satisfactory whereby a man serves eight or ten different and independent authorities? It is obvious that he should serve only one. Should districts be combined, then, for all sanitary purposes? There would be no enthusiasm for such a proposal; there would be all the opposition of the moribund district bodies; and any suggestion of a new area for local government is objectionable as adding unnecessarily to existing complications. There can be little doubt that the medical officers of health should be the direct servants of the county councils. Do not the county councils alone answer the requirements just laid down? The county is becoming a more real entity with every session of Parliament. Mr. Haldane, in the distribution of his Territorial Army, has fired the corporate body of county administration with a touch of the imagination; and as communications increase and the narrow parochialism of a country village becomes merged in the interests within reach by rail, motor, or bicycle, so village patriotism tends to lose itself in county patriotism; the tendency of each rural area is slowly centrifugal. On the

other hand the demand for inspection and assistance from Whitehall also shows daily increase, and it is impossible for the central departments of Government to be in touch, much less to sympathise, with the minor needs of each village. It was for this reason that county councils were created in '88, and have since been given direct executive powers under the Education, Midwives' and many other Acts. Let the county councils, then, have the position due to this argument. As in education, so in matters affecting the public health, of which housing is an inseparable part, the county council should be the only executive authority; and it should similarly administer its powers by means of large committees, with co-opted members, and district committees, comparable to the school-managers. By whatever steps this comes about, and the sooner the plunge is taken the better, an end should be put to the wasteful dual supervision of district work. It is the county council that can best make and modify bye-laws and be held responsible for sanitary administration in the individual districts, that can direct to the best advantage the appointment, work, and promotion of sanitary officers, that can transmit the general authority of the L.G.B. and distribute it to the thirty-three districts and 400 or 500 villages and hamlets, for instance, in Herts.

Against this it is said that the county council has already enough to do. But the objection shows ignorance of administrative methods. It is easy to increase the number of county councillors, to give them powers to add to their number from outside, to delegate their work to committees and in committee to obtain the assistance of their own officials, and of any others they will. The county council has to be the local Parliament of the future; it should actually take over, and not, as largely at present, merely supplement the functions of the Imperial Parliament. It should be given both power and responsibility, and the work of the Government offices would thereby be lightened of half their burden, enabling them to use the supreme opportunities of their experience, authority and prestige in enunciating principles of policy and assisting, controlling and supervising, on broad general lines, the action of each county council.

As regards the medical officers of health, it would be well for them to be under the immediate control of the county council, but

I would venture to suggest that the L.G.B. should establish a list of men eligible for any post of medical officer of health, and that any authority making an appointment should appoint only out of that list. This would form the nucleus of a State service, which is an end highly to be desired, both for the sake of the wider scope and firmer security and elasticity it would give to its members, also for the attraction it would exercise in those circles of boyhood from which other branches of the civil service are commonly recruited.

Sanitary inspectors should be members of a similar service in inferior grade, corresponding to that of the assistant surgeon in India, and recruited largely, as it might be, from amongst retiring non-commissioned officers of the army. Nor must we neglect in any such reconstruction to consider the Local Government Board itself. Whether medical interests would be better served by a separate Board of Health than by the existing composite department is still a moot point, although the indications are in that direction. But at least we should wish that the medical department of the Board were on an equality with the legal, and that the Board were forthwith to hold its first meeting and future meetings at regular and frequent intervals, in order periodically and systematically to discuss matters of grave importance in policy to the public health. Having thus secured an efficient administrative machine, our Utopia demands a complete register of facts concerning all house property, to be obtained and kept up to date as much as possible by private returns, and as little as may be necessary by official inspection. The county councils must be compelled to adopt bye-laws adaptable to local requirements and see them universally enforced. It must be their duty to secure adequate accommodation by building, or subsidizing building, or lowering the rates on such building; while, on the other hand, the landlord will be encouraged to demand a "living rental" for his house, and the labourer to demand a corresponding increase of wage on that at present given in many counties.

8. THE GOVERNMENT BILL OF 1908, PARTS I and III.—After what has been said, certain criticisms of the Government Housing and Town Planning Bill are inevitable. Part III makes compulsory the appointment of county medical officers, with power to L.G.B. to

prescribe their duties. One of these, it is to be hoped, makes it obligatory for them to give their whole time to public health work; but in some small counties it may be unreasonable to expect the county council to employ a man's whole time at present, unless he undertakes also much of the routine work of school inspection. It might have been advantageous to give small counties powers to combine for the purpose; and to give the L.G.B. power to pay a moiety of salary, in order to associate the Board with the appointment. By Section 58 clerks of district councils are bound to send to the county medical officer of health copies of representations and complaints due by Section 45 of the 1890 Act, under penalty of a fine not exceeding £10. District medical officers of health are bound, under similar penalty, to give the county medical officer of health any information he may reasonably require. Will he require it, at this price?

It has already been shown that the crux of the house question is the efficiency of the executive authority and its officers. This Bill, afraid of the drastic recommendations of Sir John Dickson-Poynder's Committee, leaves the machine locked. It gives no new responsibilities or duties to the county council, but gives to some of its officers the power to extort information from district officers, by which the county council may take action under its previous powers that have largely been a dead letter. The new provision will be no less a dead letter. The Bill does nothing to remedy the palpable and crying anomalies of the position of district medical officers of health and sanitary inspectors.

Part I of the Bill deals elaborately and *seriatim* with various recent proposals of housing-reformers. Terms of building loans are potentially improved. Corporate bodies may use their funds to build houses or provide land. Part III of the 1890 Act is to be compulsory, and the district council may by given compulsory powers of purchase by order of the L.G.B. Officers of the district authority or L.G.B. have power of entry after twenty-four hours' notice. There are various amendments of procedure in Part II of the Act, as regards demolition, reconstruction, and improvement, and the landlord will in future have to keep, as well as let, his houses in habitable condition. Finally, the Local Government Board may, by order, unite local bodies for any purposes of the Housing Acts;

may require reports on crowded areas; may inquire, and inspect, and declare default, and may order works to remedy default to be done by the district or county council, and enforce their orders by mandamus.

Except as regards county medical officers the Act is applicable to Scotland, but not to Ireland. Part II deals with town-planning, and has been treated separately.

Indeed, it is a curious Bill to be brought in by a Government which referred Mr. Mackarness' Bill in 1905 to Sir John Dickson-Poynder's Committee, and received its report with warm sympathy; which has professed in constant public speeches an intense interest in the housing question, and a determination to grapple boldly with the subject. The Bill throws upon the overworked staff of the L.G.B. further inspectorial duties that should be done by the county councils, and that can only be partially carried out by the L.G.B., and that at the expense of far more valuable duties. It throws upon the unfortunate public-spirited medical officers of health in the employ of reactionary councils a further unnecessary strain, and the duty of doing what in many districts will only be spasmodically done in response to local complaints or chance pressure from the L.G.B. It is a Bill for the big boroughs, not for rural districts. It neglects the weakest links in the chain. The Bill tinkers with the whole question: it leaves the main and weightiest parts of it untouched. It gives further powers to go-ahead bodies, and widens the gulf between them and their neighbours, and if it be said that the sketch of measures in our Utopia, owing to the pressure of other government measures, is for the present unattainable, we can only wish that things could be left alone until the time is ripe for the settlement of fundamental obstacles to housing reform. My own opinion is that this Bill is a reactionary measure. It is framed on wrong lines, and would seem hardly capable of proper amendment. But any movement in the direction of the crucial reforms, for which our whole sanitary administration is waiting, for the rearrangement of authorities and offices and duties, so as to include in one reasonable and uniform service the complete administration of school and general public health—any such movement is, in my opinion, deserving of the warmest encouragement, and I trust it will have the warmest encouragement of the whole meeting here to-night.

DISCUSSION.

SIR SHIRLEY MURPHY (Chairman) said that they were very much indebted to Dr. Fremantle for having dealt with a very attractive subject in a very attractive manner. He had raised many points, but, unfortunately, there was not much time left to deal with them.

MR. G. MONTAGUE HARRIS (County Councils Association) criticised the Housing Bill. He considered that it would be a very great advantage if County Councils had greater powers in regard to sanitary administration.

MISS CHURTON considered that the crux of the whole question was the sanitary administration in the country, which seemed to have been entirely overlooked in the Housing Bill.

DR. WM. BUTLER said that there was no doubt that it was due to defective sanitary administration in this country that towns grew up in a haphazard way; but he thought that they had too much to consider before arriving at conclusions as to any detailed method of reform of the sanitary service.

DR. F. J. BURMAN urged the necessity of security of tenure for medical officers of health in small districts, as at present they were at the mercy of persons who chose to put up for the local council.

DR. HERBERT JONES criticised the figures quoted by Dr. Fremantle in regard to suggested houses at Chipperfield, and pointed out that it demonstrated the fallacy of dealing with small areas.

DR. FREMANTLE briefly replied, and formerly moved the suspension of the bye-laws, with a view to the consideration of the following motions:—

1. That this Society, having considered the "Housing, Town-Planning, etc., Bill" is of opinion that no further housing measures are likely to be effective until steps have been taken to reorganise the sanitary service of the country, and put sanitary officers in a position, independent of local influence.

2. That copies of the resolutions be signed with the seal of the Society, and forwarded to the Prime Minister, and the President of the Local Government Board, and the official heads of the other Government departments concerned.

The resolution was seconded by Dr. R. Musgrave Craven, but was not carried unanimously, and Dr. Fremantle's motions were therefore referred to the Council for consideration.

THE INFANTILE MORTALITY IN CALCUTTA.

BY FREDERICK PEARSE, M.D., F.R.C.S., (Eng.), D.P.H., Health Officer, Calcutta.

DURING the year 1907 no less than 4,754 deaths of infants were registered in Calcutta. The number of births registered amounted to 16,224, so that assuming this number to be correct, the death-rate of infants was 293 per 1,000.

There is some doubt whether all the births are registered as the birth-rate calculated on the female population between the ages of fifteen and forty-five years is only 107.9 per 1,000. This is low, but even if we assume a birth-rate of 150 per 1,000 females, aged fifteen to forty-five, the mortality of infants works out at 238 per 1,000.

Still-births (1,243) are not included in the above figures, but they constitute about 76 per 1,000 on the number of registered births.

The following table, giving the numbers of deaths under the several classes will explain the peculiar incidence of diseases in this city.

INFANTILE DEATHS.—Calcutta, 1907.

	Under 1 month.	Up to 1 year.	Total.
Smallpox	10	173	183
Measles	2	15	17
Fever...	27	100	127
Malaria	5	19	24
Diarrhœa...	24	92	116
Enteritis...	24	92	116
Cholera...	—	39	39
Dysentery	10	64	74
Premature Births	524	—	524
Debility at, or } from birth }	683	7	690
Marasmus Neglect, &c.	5	28	33
Bronchitis	334	953	1287
Pneumonia	2	80	82
Tuberculosis } (all forms) }	4	3	7
Tetanus and } Convulsions }	955	73	1028
Infantile Liver	49	179	228
Syphilis	4	12	16
All other causes	97	66	163
	2759	1995	4754

So that 29 per cent. of children born (registered births) die before reaching 12 months of age, and 17 per cent. die before attaining even the age of one month.

The following comparison may be interesting.

	Infantile Deaths, Calcutta, 1907.	England and Wales, 1901.
Infectious Diseases	21.63	9.82
Diarrhœa Diseases	21.26	31.87
Convulsions and Tetanus	63.36	13.65
Pulmonary Diseases	84.38	23.25
Prematurity and } Wasting Diseases }	76.86	45.79
All other causes...	25.53	20.95
Per 1000 registered births	293.02	145.33

So far as this table affords opportunity for comparison it shows that while diarrhœal diseases carry off many more infants in England, than in Calcutta, the opposite is the case with regard to pulmonary diseases. Convulsions and particularly Tetanus kill off a large proportion of infants in Calcutta. Tetanus is probably explained by the custom of rubbing dirty earth into the navel. Careless exposure explains the large incidence of pulmonary diseases. The large numbers of still-births and premature births and deaths from congenital debility, show the inherent weakness of the great mass of the population.

THE INFECTIVITY OF DESQUAMATION IN SCARLET FEVER.*

By S. G. H. MOORE, M.D., D.P.H.,
Medical Officer of Health, Huddersfield.

IN advancing the thesis that desquamation may be disregarded as evidence of the infectivity of persons convalescent from scarlet fever, it is necessary to define exactly what one means. Particles of epithelium exfoliated from the bodies of persons suffering from an infectious disease, during the infectivity thereof, of course are infectious, just as is any particular matter given off from the patient, and just as are all articles (*e.g.*, underclothing and bedclothing) with which he has been in contact. But in like manner as these latter may be disinfected when the acute and infectious stage of the disease has passed away, so may be disinfected the "peeled" or "peeling" skin. In other words, desquamation does not connote pathological conditions continuing in the patient which are necessarily infectious, and it is not beyond the resources of medicine to disinfect the surface of the body for practical purposes, *pacè* the surgeon's ideal of absolutely aseptic hands.

Desquamation continues long after convalescence has been completely established—after the temperature has been normal for weeks—it is unaccompanied by any inflammatory processes, or other sign of pathological condition. The infectivity of scarlet fever, as is well known, begins before desquamation commences, and it may continue for a long time after the process is completed—evidence that it is not essentially associated therewith, but independent—that both are mutually independent.

To establish the present thesis positively is impossible. No one can give absolute proof of a negation, and here it is sought to establish that desquamation is *not* necessarily infectious. But, on the other hand, if desquamation were necessarily infectious, having regard to the wide-spread occurrence of the disease, positive proof of an overwhelming kind would surely be forthcoming. But who can point to one single instance, where the conditions being fulfilled, proof can be adduced?

If, however, from the very nature of the thesis evidence of a positive nature be unavailable, negative evidence is abundant.

* A Paper read at a Meeting of the Yorkshire Branch, held at the Town Hall, Leeds, November 27th, 1907.

Further theoretical considerations, in the light of modern information, are not absent. In a survey of the skin conditions, which are infectious or contagious, it is to be noted that those in which suppurations are present differ with regard to infectivity from those in which it is absent, thus small-pox, impetigo, syphilis, paronychia, septic wounds, pyæmia and certain forms of eczema are infectious. On the other hand, typhoid, typhus (the skin lesions in), psoriasis, urticaria, erythemata, and (?) scarlet fever are not. Again, having regard to the anatomy of the organ, it must be assumed that the organism of the disease in scarlatina is conveyed to the skin in the blood; but there is circulation neither of blood nor lymph in the epidermis. Thus the organism does not reach it. But it is the epidermis which is exfoliated.

Again, a consideration of the pathological changes in scarlet fever in relationship with the anatomy of the parts affected cannot but impress us with the extreme probability that it is in the nose and accessory cavities, such as the recesses about the turbinate bones, the frontal sphenoidal and ethmoidal sinuses, the *antrum*, and, where we have had otitis, of the cavities in communication with the middle ear, that we must look for the lengthened persistence of infections. Here we have the conditions favourable to the growth of micro-organisms, heat, moisture and a suitable pabulum; while, on the other hand, the skin is dry and exposed more or less completely to the disinfectant influence of light and air.

Bacteriological considerations also, so far as they give us any indication, are all against the proposition that infection necessarily resides and continues in the skin. The evidence in favour of Klein's streptococcus being the specific micro-organism is very strong, particularly if we accept his dictum that the *Streptococcus conglomeratus* of Kurth is identical with his *Streptococcus scarlatinae*; but while these germs could both be isolated from many tissues, repeated examinations of the skin give negative results. They both had a tendency, like the Klebs-Loeffler bacillus, to persist in the throat and accessory cavities.

There are many statistical considerations which also go to support the negative thesis. Thus, in Birmingham, during 1894-1896 out of 2,500 cases discharged, 8 per cent. were deliberately discharged with desquamation on the feet, but only 6.5 of the patients giving rise to return cases were noted to have shown signs

of desquamation. In Southampton, Leicester, and other places, desquamation is disregarded and the results are satisfactory. In the Eastern Hospital of the Metropolitan Asylums Board, it was found that there was a reduction in the number of "return" cases, after a reduction in the period of detention of scarlet fever cases in hospital, and Professor Simpson has made the definite statement that "whatever other reason there may be for the long detention of scarlet fever patients in hospital, the information available is against its reducing the liability to personal infectivity."

Dr. Killick Millard, the Medical Officer of Health, Leicester, inquired by circular of twenty-five superintendents of the principal fever hospitals, if, in their opinion desquamation of itself is a source of infection in scarlet fever cases. He received twenty-one replies. Sixteen stated definitely that they could produce no evidence that desquamation *per se* is a source of infection, that too much importance has in the past been attached to desquamation as a source of infection, and that experience does not support the popular view that a desquamating patient is necessarily an infective one, but on the other hand patients may continue to desquamate freely after the cessation of infection.

The other five replies were of a less definite nature.

It appears that in the different hospitals of the Metropolitan Asylums Board, the percentage of return cases varies within narrow limits, while the percentage occurring in the different metropolitan boroughs varies very widely. This would appear to indicate the existence of a factor or factors in this problem altogether distinct and apart from hospital influence.

The following list is very striking indeed:—

Name of Town or Place.	Percentage of Return Cases.
Lewisham ...	12.4
Newcastle-on-Tyne ...	8.4 { period of excessive prevalence
Sunderland ...	7.8
Wandsworth ...	7.7
South Shields ...	{ 5.5 in 1903 5.4 in 1904
Fulham ...	5.4
Stoke Newington ...	5.2
Finsbury ...	5.1
Shoreditch ...	5.0
HUDDERSFIELD (old system)	4.8
HUDDERSFIELD (new system)	4.0

Name of Town or Place.	Percentage of Return Cases.
Manchester ...	3.8 { Period of excessive prevalence
Stepney ...	3.3
Metropolitan Asylums Board	3.09 in 1903
Woolwich ...	3.0
Southampton ...	2.4
Newcastle-on-Tyne ...	2.2 { During normal prevalence
Manchester ...	1.2 { During normal prevalence

In the metropolitan boroughs in the above list, only cases arising within 14 days are included as return cases.

The variation is seen to be from 12.4 to 1.2 per cent. of cases treated. The limit of variation in the different hospitals of the Metropolitan Asylums Board is expressible by decimal points. It follows—it is a mathematical certainty—that in the production of return cases the influence of hospitals or hospitalism is not the sole factor. A consideration of the figures will convince an impartial observer that it is not the principal factor. One may conceive that some return cases result from hospital influences. It may well be that there is an irreducible minimum to be attributed to the results of isolation in large hospitals. But a consideration of the foregoing figures goes to show that outside influences are very much greater.

In Huddersfield during the three years, 1902-3-4, when the system of detaining scarlet fever patients in hospital, until desquamation was completed, was in vogue, the mean case mortality was 3.6 per cent., whereas during the years 1905-6, it was only 2.0 per cent. In addition to this the number of complications in scarlet fever patients was much less during the latter period than during the former. This, of course, is what one would naturally expect, when it is borne in mind that when patients are discharged without regard to the presence of desquamation, their stay in hospital is reduced by about 30 per cent., which results in a diminution of the number of cases in the hospital at any one time, thereby leaving a larger amount of cubic space available for each patient, and enabling each case to receive more individual care.

In Huddersfield Sanatorium the average cost per patient per day, if fixed charges be excluded, namely:—interest on capital, rates, income tax, insurance and telephone rent,

is 3s. 8d.; if, further, all charges (including salaries), be excluded, with the exception of food, drugs, coal, light, water, soap and disinfectants, the amount becomes 1s. 11'4d.—say 2s. per day.

The average duration of stay in Hospital before the introduction of the system of disregarding desquamation, was 44·3 days, since the introduction it is 29 days. The saving per annum varies, of course, with the number of patients under treatment. In Huddersfield, at the lowest computation, it is about £500 per annum, and on the highest it rises to as much as £1,900 per annum.

DISCUSSION.

DR. TROTTER said he remained unconvinced in spite of Dr. Moore's able paper. Dr. Moore admitted that desquamating skin was a possible carrier of infection if not disinfected, but Dr. Trotter did not think disinfection of the skin was possible, at least most surgeons had given up the attempt to disinfect it and wore gloves; the specific cause of scarlet fever remained unknown, and, until proved to be low-resisting must be taken to be high-resisting, and therefore, from surgical experience, not to be satisfactorily destroyed by skin disinfection. He considered the desquamation just as much a part of the disease as the sore throat, not a dermatitis desquamation, since it occurred in cases where no rash had ever been discovered, and a specific manifestation like this was, he thought, to be regarded as associated with the specific cause of the disease. Dr. Moore had divided diseases associated with skin symptoms into those with discharge (infectious) and those without (non-infectious), but he dissented from his views, as eczema without engrafted septic conditions was not infectious, and scarlet fever could not be classed with enteric, as the spots did not desquamate. It was not an uncommon experience for desquamation to be deferred until after the twenty-nine days, which was the average period of detention in hospital under Dr. Moore's system; if, as Dr. Moore admitted, desquamation might carry infection, what of these cases, and what of the patients who developed rhinitis or otitis after this early discharge from hospital when no longer under control? With regard to sending out desquamating patients without getting a crop of return cases, he thought Dr. Moore's six monthly period figures vitiated some of his others, e.g., cases as the seventy-one in November, 1904, might have gone out when the percentage of returns was likely to be almost nil, for these remarkable variations might occur over shorter periods than six months.

DR. SADLER thought it unsafe to discharge scarlet fever patients before the forty-ninth day of disease in ordinary cases, or the eighty-fourth day in cases with otorrhœa or rhinorrhœa. He urged that to discharge patients who are still desquamating freely, might result in actions for

damages against sanitary authorities, and that 5 per cent of return cases was too high a figure to encourage other administrators to follow the example of Huddersfield.

DR. ANDERSON said he was inclined to agree with Dr. Moore regarding the non-infectivity of desquamating skin, though he did not think we had sufficient proof one way or the other. It seemed a pity that Dr. Moore had vitiated his experiment by using salicylic acid, for it was impossible in practice to distinguish between desquamation as an infective process *per se*, and desquamating skin becoming infective in some way or other by contamination. If, for the sake of argument, we considered desquamation as a non-infective process, it did not seem it would make much difference in our administrative methods. Taking diphtheria—a disease which is not attended, as a rule, by septic complications, and in which the infection is certainly not so protracted as in scarlet fever, we know that many cases are not free from infection for six weeks or longer. If, however, we take three weeks as the average period of infectivity for an ordinary case of diphtheria, it would not be safe to discharge such a patient from hospital within four weeks of the onset. In the case of scarlet fever we must add an extra twelve or fourteen days to the probable period of infectivity of an ordinary uncomplicated case, so that it would appear to be a wise proceeding not to discharge such a case until about six weeks had elapsed from the onset of the disease. Thus, even under the most favourable circumstances, we are pretty much in the same position as before. Scarlet fever complications as rhinitis, otorrhœa, do frequently occur at a late stage of the disease, whether the child is kept separate from the other patients in hospital or isolated at home, and it would be surprising if some of the patients discharged by Dr. Moore did not develop complications after their return home. Dr. Moore might inform us whether these patients were kept under observation for three or four weeks, and whether any complications developed subsequent to their discharge. If so, we should want to know the actual numbers, so as to enable us to make a comparison with hospital cases developing late complications.

DR. KNIGHT thought the statistical evidence adduced by Dr. Moore in support of his contention that the desquamating skin of a scarletinal patient was not infectious, could only be regarded as suggestive and by no means conclusive. More extended observations were necessary in order that a definite conclusion should be arrived at. The particular outcome of Dr. Moore's procedure was greatly to diminish the stay of the scarlatinal patient in hospital, and, therefore, was to be recommended on the score of economy. On the other hand, this lessened period of detention was, in itself, a source of danger, as otorrhœa, rhinorrhœa, or other infective complication might arise, after the dismissal of the patient.

The function of an infectious hospital was not only to prevent the spread of disease, but also completely to restore the patient to health, and there was the danger that this latter point might be overlooked under the new procedure.

DR. FORSYTH pointed out that he had only two return cases from a total of 208 cases discharged from the hospital. He considered it dangerous to discharge a patient with any desquamation, as by so doing there was great risk of being censured.

DR. MUSCHAMP drew attention to the fact that many cases may be quite simple during the first four weeks, but become complicated before full convalescence. As at present considered, the method of estimating "return cases" was erroneous, because it only recognised those occurring in the same household. He then discussed the question of secondary attacks in the same patient.

DR. SPOTTISWOODE CAMERON remarked that he was afraid if the idea of the non-infectivity of desquamation was widely proclaimed, parents would find many excuses for non-isolation. The skin could undoubtedly carry infection just as a towel, and therefore, one ought to speak very guardedly and cautiously.

DR. CASTLE drew attention to a second attack of scarlet fever in the same person after an interval of seven weeks.

DR. HALLIWELL bore out the question of relapses or secondary attacks in scarlet fever, adding that there is much we do not know about this disease, its rashes and desquamation. He had seen cases in children with all the symptoms of scarlet fever, but still felt doubtful. These he had isolated, but had seen no sign of desquamation and no infection to others. He thought it exceedingly unwise to disregard desquamation owing to our present want of knowledge of the disease.

DR. MARTIN said he had much to learn before he discharged scarlet fever patients at the end of four weeks. In ten years he had discharged 814 cases with an average stay in hospital of forty-six days, and had not reached 1 per cent of return cases. It ought to be remembered, he said, that, three-fourths of the cases of scarlet fever are badly nourished and require feeding. Being asked whether he regarded the desquamation on the feet as less infectious than on other parts of the body, he replied that the first was a primary desquamation and that the late desquamation afterwards was not infectious.

DR. SCATTERTY said that the peeling of the feet after the six weeks he disregarded, but as a part-time man he left the responsibility of discharging the patient from the hospital to the medical attendant.

Some discussion then followed on the question of toxine rashes.

In his reply, DR. MOORE agreed that in the early discharge of a patient from the hospital, if the parents wanted to make trouble, they were in a position to do so. If he had been a "part-time man," he might not have taken his present attitude. He regarded Dr. Martin's idea, that late desquamation is not infectious, as peculiar. Desquamation was either one of two things—first, the throwing-off of infective material, or secondly, an expression only of other processes not connoting infectivity. If it may be disregarded when "late," then also when early, since it is all one process. After all, he said, scarlet fever, as a clinical picture, may be regarded as an expression

of a throat infection, the micro-organism existing in the cavities of the nose and throat, and forming there the toxins which in the blood produce the symptoms which we call scarlet fever. The rash following burns or scalds resembles that of scarlet fever, and results from the absorption of serum following blistering, which contains complex organic bodies similar to toxins.

He pointed out that the desquamation of scarlet fever probably resulted from overgrowth of the epidermis resulting from the hyperæmia associated with the rash, and that there was no evidence of a specific nature for its association with a micro-organism.

The adjourned discussion took place on March 27th, 1908, at the Educational Offices, Leeds, and was opened by the HON. SECRETARY (Dr. Kaye) with a synopsis of the proceedings at the previous meeting.

DR. SADLER then detailed his method of work at the Kendray Hospital, Barnsley, which is briefly as follows:—

1. Spraying of wards daily with formalin, in addition to cleansing and the keeping of open windows.
2. Classification of cases and the separation of those suffering from otorrhœa, etc.
3. Bath on admission if patient is not too ill. When the rash has faded and the temperature is normal, a disinfecting bath every two days until the thirty-eighth day. The throat is douched with permanganate of potash or chlorine solution for twenty-one days. The patient is kept in bed for twenty-one days with the idea of checking late nephritis.
4. Treatment of discharges of the nose, etc., by izar or chinol.
5. Detention in hospital for forty-two days for adults, forty-nine for children, and eighty-four for patients with discharges such as otorrhœa.
6. Special treatment is carried out during the last ten days of isolation, e.g., a daily disinfectant bath, throat irrigated with a chlorine gargle, nose douched with chinol or izar.
7. At the discharge block the three rooms are used, and the bath-woman must not be a nurse, but entirely away from infection.
8. The care of disinfection, and the necessity of always testing the disinfecting process with a maximum thermometer enclosed in at least six layers of flannel.
9. Carefully watching disinfection at the home, particularly of toys and Sunday clothing.

A discussion followed, in which Drs. Moore, Milne, Castle, and Muschamp took part.

N.B.—An account of the Meeting on November 27th, 1907, appeared in the February number of the Journal, p. 341, but Dr. Moore's paper was held over pending the conclusion of the discussion.

PERSONAL INFECTION IN PULMONARY TUBERCULOSIS.*

By JOHN J. BUCHAN, M.D., D.P.H.,

Medical Officer of the County Borough of St. Helens.

IN the causation of pulmonary tuberculosis so many intimately related factors play a part, that it is impossible to focus attention on any one without having regard to certain of the others. One factor, the presence of the tubercle bacillus, is essential, but this has been proved to be so universal that a tendency has arisen to regard the other elements in the causation as of more practical importance in the prevention of the disease. There seems, to some extent, to be a divergence of views on the subject at present, which is excellently illustrated in recent publications by the Local Government Boards of Scotland and of England and Wales. The attitude of the Memorandum of the Local Government Board of Scotland, issued two years ago, is to regard the infectious nature of pulmonary phthisis as all important in its prevention; while in Dr. Bulstrode's report to the English Local Government Board, issued in January of this year, the attitude with respect to infection is more judicial, viewing the disease as one of low infectivity, apparently unconvinced that special measures taken because of the infectivity will meet with a success proportional to the efforts.

The term "infectious," as applied to the acute infectious diseases, has a very general meaning; it merely serves to indicate that in some way or other a second case has arisen from the first. It is not related to the duration of the disease, nor the amount of infection required to transmit it, nor to the manner in which infection is given off or taken up. If we seek to inquire whether a disease be or be not personally communicable, it is necessary to examine its behaviour under all kinds of circumstances, and especially those in which it shows the greatest prevalence. The conditions found in hospitals or sanatoria for consumption are not at all to be compared with the conditions to be found in the bedrooms of the poorer working classes of the community to-day. Even fifty or sixty years ago the patient would not be allowed to spit about anywhere in a hospital, nor would its cleansing

* Read before a meeting of the North-Western Branch of the Incorporated Society of Medical Officers of Health.

be quite so infrequent as it is in a large number of the homes to-day. It cannot therefore be conceded, having regard to the conditions in which tuberculosis probably spreads, that "hospitals and other institutions for the treatment of tuberculosis should prove the most likely sources of evidence" as to the infectious nature of pulmonary tuberculosis.—(Dr. Bulstrode's Report.) The well-known work of Dr. Niven has been undertaken under better conditions for estimating the part played by personal communicability in pulmonary tuberculosis, and much greater value must therefore be placed on his results. His investigations, as well as those of Dr. Newsholme, lead to the conclusion that tuberculous phthisis is infectious when there is intimate and frequent association with the sick; Niven, in a recent report, stating "that the dose of infection and its repetition are of cardinal importance," and that "by sufficient and repeated dosage with infection the strongest persons may be made to succumb."

To examine the behaviour of pulmonary tuberculosis in a community with regard to infectivity is an especially complicated problem, the chief difficulty in which arises from cases either being unrecognised altogether or the early symptoms in them being unrecognised for a long time. It frequently occurs that the true nature of such cases can only be inferred by a process of reasoning, and in regarding them as tuberculous, one is liable to assume what one is attempting to ascertain. The question is further complicated by ideas of hereditary predisposition—a factor which, in the great majority of instances, cannot be eliminated, the importance of which also decreases or increases with the greater or less value placed upon infection.

In the town of St. Helens there is comparatively little immigration or emigration going on, and most families can be traced through a number of years. During the last seven years 939 cases of tuberculous phthisis have been inquired into by the Health Department, the information with respect to them being ascertained by investigations made on the receipt of notification, or shortly after the registration of death. A voluntary system of notification has been in operation since 1899. Taking the word family to mean all the persons living in one house at one time, the number of families affected was 731. In 140 families two or more cases of phthisis are known to have occurred during the period mentioned, the number of

persons affected in these families in the seven years, being 348. The proportional number of families in which more than one case of pulmonary tuberculosis has occurred during this time to the total number of families affected is, compared with the acute infectious diseases, high; but such comparisons are difficult and inadvisable to make, as the conditions vary so much. It is a very difficult matter to ascertain which member of the family was first affected with tuberculosis, and in which member the symptoms first subsequently appeared, but in 92 instances in the 140 families it seemed possible to single out an illness as that which occurred first, while in the remaining 48 this could not be done.

The number of husbands affected living with their wives was 289, while the number of wives affected living with their husbands was 153; the proportion, therefore, of husbands affected subsequently to their wives is much greater than the proportion of wives affected subsequently to their husbands. So far as these figures go, they seem to indicate that where the wives and mothers are affected, subsequent cases are about twice as liable to occur in other members of the household than when the husband or father is affected.

By examining the age and sex of the subsequent sufferers in the children of the family, when one or other of the parents was first affected, certain facts are elicited ap-

SUBSEQUENT SUFFERERS IN TWENTY-THREE FAMILIES WHERE THE FATHER WAS FIRST AFFECTED.

Sex.	Under 1 year.	1-5	5-10	10-15	15-20	20-25	25-30	Over 30	Total.
Male	1	2	1	1	3	3	4	—	15
Female	1	4	3	2	1	—	—	—	11
Total	2	6	4	3	4	3	4	—	26

SUBSEQUENT SUFFERERS IN THIRTY FAMILIES WHERE THE MOTHER WAS FIRST AFFECTED.

Sex.	Under 1 year.	1-5	5-10	10-15	15-20	20-25	25-30	Over 30	Total.
Male	5	2	2	1	—	5	2	1	18
Female	2	5	3	2	4	2	—	1	19
Total	7	7	5	3	4	7	2	2	37

In these 92 families, in 23 the father was the first sufferer and the children first subsequently affected, while in 30 similar cases the mother suffered first. The total number of fathers affected living with their families was 308, while the number of mothers was 171. The proportion of instances, therefore, in which secondary cases were known to have occurred among the children was much greater when the mother was first affected than in the case of the father. In seven other families the husband was the first sufferer and the wife the first subsequently affected, while in eight families the wife was the first sufferer where the husband was first subsequently affected.

parently indicating infection by close association.

Though the number dealt with in these tables is too small to found any general conclusion on, yet they help to eliminate the factor of heredity, as hereditary predisposition ought theoretically to act equally in regard to all children. It will be noted that, when the fathers suffer first, adult sons and young children are most frequently affected subsequently. In only one instance was a grown-up girl affected, and in this case she was actively engaged in nursing her parent. When the mother, on the other hand, is the first sufferer, the proportion of infants, young children and

HOUSING AND TOWN-PLANNING BILL.

MEDICAL OFFICERS OF HEALTH.

Anomalies connected with the methods of their Appointment.

By HERBERT JONES, L.R.C.S., D.P.H.

MEDICAL Officers of Health in this country were first appointed under the provisions of the Towns' Improvement Clauses Act, 1847.¹ This Act extended only to such towns or districts in England and Ireland, concerning which future Acts of Parliament directed its sections to be incorporated. There was no obligation resting upon a sanitary authority to appoint a medical officer of health until the passing of the Metropolis Local Management Act, 1855, Section 132 of which Act required every vestry and district board to appoint one or more medical officers of health, who could be removed from office at the pleasure of the vestry or board. They were not appointed for a limited period, and practically held office during good behaviour.

The Public Health Act of 1872 required every sanitary authority outside the metropolis to appoint a medical officer of health, and gave to the Local Government Board the same powers that they had in the case of a district medical officer of a union, with regard to the qualification, appointment, duties, salary, and tenure of office of a medical officer of health, any portion of whose salary was to be paid out of monies voted by Parliament.² There was, however, placed upon these powers an important limitation. The appointment of the medical officers of health, first made after the passing of the Act, could only be for a period not exceeding five years. In fulfilment of their powers the Local Government Board made an Order dated 11th November, 1872.³

The Public Health Act, 1875, re-enacted the provisions of the 1872 Act with regard to the appointment of medical officers of health, but there was no proviso that the appointments first made should be for a period not exceeding five years. On the 23rd March, 1891, the Local Government Board made an Order, cancelling all previous Orders regulating the appointment of Medical Officers of Health.⁴ This Order is now in force.

It has been already stated that the statutory powers of the Local Government Board with

regard to the qualifications, appointment, duties, salary, and tenure of office of a district medical officer of a union and of a medical officer of health, any portion of whose salary is paid out of monies voted by Parliament are identical. It was apparently the intention of Parliament that the position of these two officials should be the same with respect to the particulars named. As regards the order regulating tenure of office, the Board has, however, made a very essential difference.

Article 2 of the Order of 1857 prescribes that "every district medical officer . . . shall hold his office until he shall die, or resign, or be proved to be insane . . . or become legally disqualified to hold such office, or be removed by the said (Local Government) Board . . ."

But *Article 10* of the 1891 Order, relating to medical officers of health, prescribes that "every officer shall continue to hold office for such period as the sanitary authority may, subject to our approval, determine at the time of his appointment, or until he die, or resign, or be removed by such authority with our assent, or be removed by us, or be proved to be insane by evidence which we shall deem sufficient."

The Local Government Board has upon several occasions been asked, not only by the Incorporated Society of Medical Officers of Health, but also by the British Medical Association, to make an Order relating to medical officers of health in the same terms as that relating to district medical officers, but the reply to the request has always been that the Board could not deal with the question of security of tenure by an Administrative Order, and that any change required should be effected by legislation. No reasons for holding this opinion have ever been given by the Board, and it is contrary to that expressed by Mr. Alex. Macmorran, K.C.

Assuming that the view taken by the legal advisers of the Board is correct, the introduction of the Housing and Town Planning Bill presents a suitable opportunity for effecting the desired change by legislation. Part III of the Bill deals with the appointment of county medical officers of health, and an additional clause might very properly be inserted in some such terms as these:—

"A medical officer of health shall not be appointed for a limited period, but shall be removable from office by the electing authority,

after suitable notice has been given him, and with the consent of the Local Government Board."

It may be convenient to inquire what are the arguments which are usually presented in opposition to the proposal to place sanitary officers in the same position as that occupied by other civil servants, and by medical officers of health in Ireland, Scotland and the metropolis.

They may be said to be these:—

1. The sanitary officer, being elected by the local authority, it would be contrary to the principle of decentralization if that authority had not full and unfettered powers of dismissal.

Those who use this argument either do not know, or they forget, that the local authority pays only one-half of the salary of the official, yet entire control over his appointment is claimed. If decentralization is to be complete, there must be no payment from central funds.

2. That the sanitary officer will be too progressive, and will make proposals to the sanitary authority which they will not be disposed to carry out.

The sanitary officer is invested with hardly any statutory powers. His function is that of a reporter of insanitary conditions and an adviser as to the best means of remedying those conditions. The local authority can alone decide whether the remedy shall be applied.

3. That the sanitary officer will become lax in his duties.

This argument is the reverse of the previous one, and if the doctrine is to be recognised that a public official requires the stimulus of frequent re-election, combined with the risk of non-re-election, to enable him to carry out his duties properly, the practice must be adopted with respect to all officials. A Poor Law medical officer or a medical officer of health may be removed from office by the Local Government Board under the Orders of 25th May, 1857, and 23rd March, 1891; and although the late President of the Local Government Board said that it was a very serious matter to dismiss a man, yet, as a fact, during the past six years about twenty Poor Law medical officers have been dismissed by the Board.

4. That there are some sanitary officials who are incompetent, and who ought not to be retained in office.

If the present method of appointment effected the removal of the incompetent official, there would be every reason for its retention. As a fact, it does just the reverse, and the many instances of removal from office which have been recorded during the past years have shown that it is the competent and not the incompetent men that have been got rid of. Indeed, it is because of their competency and their desire to carry out their duties conscientiously that they have lost their positions. It must be remembered, too, that if it is true there are a large number of incompetent officials, a very grave responsibility rests upon the Local Government Board for sanctioning their appointments and re-appointments.

5. That in the event of it becoming desirable to form a combination of districts for the purpose of jointly appointing a medical officer of health, the project would be rendered more difficult if one or more medical officers in the district concerned held office permanently.

In the case of Poor Law medical officers such an event is amply provided for, and there should be no difficulty in applying a similar regulation to medical officers of health. Article 5 of the Order of 25th May, 1857, provides that, with the consent of the Local Government Board, six months' notice to terminate his appointment may be given to a Poor Law medical officer, if he does not acquiesce in the rearrangement of his district.

6. That the local authority desires to keep the medical officer of health under its thumb.

This final argument is either unanswerable or it answers itself.

In the following pages will be found very definite recommendations in favour of non-lapsing appointments from Royal Commissions, Departmental Committees, and other quarters, dating as far back as 1871. These recommendations are expressed clearly and precisely, and in the case of the Inter-Departmental Committee on Physical Degeneration, after hearing the evidence of Mr. John Lithiby, an Assistant Secretary of the Local Government Board, who has for many years been intimately concerned with public health appointments. In his evidence before the Committee, Mr. Lithiby said that, although he was not quite sure whether the time was ripe for the

¹See page 161.

²See page 161.

³See page 162.

⁴See page 162.

exercise by the Local Government Board of the power of vetoing the dismissal of sanitary officers, he thought the time was approaching. This opinion of the Board's Assistant Secretary was expressed in 1904, and it may well be asked, after an interval of four years, whether the Board should not give the weight of its influence in favour of a reform which has been advocated for more than thirty years and the want of which has done more than anything else to retard sanitary progress, and to bring sanitary administration into disrepute.

RECOMMENDATIONS OF ROYAL COMMISSIONS, ETC., IN FAVOUR OF NON-LAPSING APPOINTMENTS OF SANITARY OFFICERS.

The Royal Sanitary Commission (upon whose recommendation the Local Government Board was established) in a Report, presented to Parliament in 1871, stated "In order that medical officers of health may be able to discharge their duties without fear of personal loss, they should not be removable from office by any local authority, except with the sanction of the central authority."

The Report of the Royal Commission on Labour contained the following recommendation:—"We also approve of the suggestion . . . that the medical officer of health in each district should not be allowed to be in private practice; that he should give up his whole time to the duties of his office; and that he should not be removable without the consent of the Local Government Board."

In a Memorandum to the Housing Commission Report of 1885, Mr. Dwyer Gray, M.P., stated:—"Much good might be effected if, upon the appointment of every medical or other sanitary officer, his salary, the rate of increase on that salary, and the terms of his superannuation were fixed, as in the case of civil servants, and he were appointed to hold office 'during good behaviour'—a well-understood legal term—and were removable by the local authority only for misconduct or neglect of duty. This change would be no interference with the principle of local government, while it would have the effect of freeing sanitary officers from undue interference in the discharge of their duty after they had been appointed."

The Inter-Departmental Committee on Physical Degeneration in 1904 reported:—"118. Another change which might effectually reinforce the cry for improvement in many places would be to grant security of tenure to the medical officers of health, who, as a rule, hold office at the goodwill of the local authority. Such security is enjoyed in Scotland and in London, and the Committee, who had the advantage of hearing the evidence of Mr. Lithiby, Assistant Secretary of the Local Government Board, on the point, think that in no case, unless convicted of misconduct, should a medical officer of health, not engaged in private practice, be removed without the consent of the Local Government Board, and that in all areas above a certain population he should be required to give his whole time to the work."

The following is the evidence which led to this recommendation being made.

Of Mr. B. SEEBOHM ROWNTREE.

5237. If we are told, as most people seem to think, that the law is strong enough, how is it possible that those things (insanitary conditions just described by the witness) can go on?—Because you have a council with very low ideas. Their medical officer of health reports that certain houses are insanitary; the council inspects them and says: "We are not going to take action in this case, it is all right." They do not know. Then there is nothing for it. The medical officer of health dare not write to the Local Government Board, because he would be dismissed, and therefore it requires somebody independently to take the odium upon himself, which is very considerable sometimes.

5238. Can a medical officer be dismissed by a county authority without the consent of the Local Government Board?—They certainly can in towns.

5239. Everywhere except London. You would advocate something being done to improve their security of tenure?—Yes, I think it should be done, because it is very difficult for a progressive medical officer as things are now.

5240. It is practically impossible for a man to carry out his duty?—Yes, he cannot do it.

5241. Without losing his livelihood?—That is so.

5242. Therefore, although the law is strong enough, the means of carrying out the law are not sufficient?—No.

Of Mr. T. C. HORSFALL.

5630. Is not there a body of permanent officials in every town council?—But when you speak of the permanent officials, you have, for instance, the chief medical officer of health, but he is only in a subordinate position, and his freedom of action is very much interfered with.

5631. And his tenure of office is insecure except in London?—Yes. He cannot give offence to all the members of the town council, and he ought to be able to do so.

5632. Because he is liable to dismissal?—Yes.

5633. Would you suggest that the Local Government Board should have a veto upon his removal from office?—I would deprive the local body of the right of dismissing the medical officer of health.

Of Miss M. GARNETT.

9139. You would be disposed to make the medical officer of health independent of the local authority?—Yes.

9140. So that if he took a strong line, of which they disapproved, they could not punish him by dismissing him?—I think, so far as the housing accommodation, and all these other things are concerned, that would strike at the very root of the matter.

9141. When once appointed, he should be independent, and hold security of tenure as against his employers?—Yes.

9176. With regard to the housing of the people, you have spoken of a difficulty which is experienced of making landlords keep their property in decent condition. It is due, to a great extent, I believe, to the fact that much of the property is owned by members of the town council?—Yes, I think so.

9177. The inspectors and other officers of the council are removable by the local authority?—I imagine so.

Of Mr. JOHN LITHIBY.

13500. Is it not desirable that the area should be large enough to employ a man (medical officer of health) for the whole of his time, rather than it should be combined with private practice?—Certainly.

13501. That is a good thing?—Certainly.

13502. You deprecate the combination of the duty of a medical officer of health with a continuance of private practice where it can be avoided?—Certainly. In the Local Govern-

ment Board the preference is decidedly in favour of those men who devote their whole time to it, who have special qualifications, and who do not engage in private practice.

13503. I suppose, in the cases of employment of such, it would be more easy to guarantee them a greater security of tenure?—I think so.

13504. Where they are efficient officers?—Yes. I would not say the others are not efficient according to their lights, but where the officer is giving his whole time to the work, and has a diploma in sanitary science, it is the practice of the Board now to invite local authorities to appoint him either permanently or for a longer period than the one year which is often proposed.

13511. (Dr. Tatham). The question seems to be that in the case of an energetic medical officer of health, who really wishes to do his duty, and to do it quite in conformity with the wishes of the Local Government Board, the fact that he does his duty is sufficient to lose him his office. I have in my mind now the case of a man who was quietly told by his council—a borough council, too—that if he continued to exercise his discretion, and to try and improve the sanitary condition of his district, they would get rid of him. They told him that deliberately. I know that that was done. That seems to be the great objection to allowing local authorities absolute power of dismissal?—As to that, of course, I can only say what has officially come before the Local Government Board. There have been a few cases of that kind. We have heard of others, but very few cases have been specially brought to the notice of the Board in which that has occurred.

13512. I am speaking of a period now of some fifteen years ago. Perhaps it was more common then than it is now?—There have been cases.

13513. (Chairman). But if the Local Government Board have no effective power of interference, they would not bring them to your notice, would they?—The successor, or some friend of the retiring officer, usually writes and says:—"So and so is happening, can you prevent it?"

13514. I suppose you say that you cannot?—As a rule, we cannot. As a rule, we can only make inquiries and give advice, and, if the new officer is appointed, the Board may decline to approve that appointment. The

Committee will see that it is a serious step to take, because the new officer may be a perfectly competent officer, against whom nothing may be known, and it would be an arbitrary exercise of power, if the Board were to say that they will not recognise the incoming good man, because there is an outgoing good man whose services are no longer required by the local authority.

13515. And, in fact, you never do so, I suppose?—I cannot say. We have prevented the dismissal of officers in some cases.

13516. Do you not think, with a view to placing your power of prevention upon a satisfactory basis, that it would be a very good thing to vest in the Local Government Board the right of veto; then there could be no question?—Whether the time is ripe for such an exercise of the power of the Board I am not quite sure, but I think the time is approaching.

The Select Committee of the House of Commons on the Housing of the Working Classes Act Amendment Bill recommended in 1906 that "Officers (of health) should devote their whole time to the duties of their office and should hold their appointments during good behaviour and be removable only with the consent of the Local Government Board."

The same Committee states (paragraph 46) that "by placing sanitary matters under the inspection of capable and disinterested officials, influenced by no local prejudice or interests, greater uniformity and efficiency in administration will be secured."

In 1895 a largely attended deputation to the Local Government Board urged that it was detrimental to the best interests of the public health, and the efficient carrying out of the laws relating thereto, that medical officers of health should be appointed for limited periods and on a precarious tenure of office, and that it was desirable that similar provisions to those of the Public Health (London) Act, 1891, sec. 108 (1) (2) (b) and (c), should apply to all medical officers of health in England and Wales.

In the course of his reply to the deputation, the Parliamentary Secretary to the Board (Sir Walter Foster) said:—"The Board has arrived at a rather important decision—viz., that we consider these appointments for short periods and precarious tenure injurious to the public health. We are at one with you that 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. We recognise that these offices are very delicate and difficult, as well as exceedingly responsible, and while a man is elected from year to year by a sanitary authority who may be offended by his zeal for the public health, we feel he cannot discharge his duties in the way they ought to be discharged. We have, therefore, arrived at the decision that we shall encourage local authorities all over the country to make these appointments for longer periods, and, if possible, permanent appointments."

MEMORANDUM PREPARED BY THE LATE DR. W. T. G. WOODFORDE UPON THE PUBLIC HEALTH BILL, 1872 (35 and 36 Vict. cap. 79).—Extract from *Hansard*, 1872.

In the Bill, as introduced by Mr. Stansfeld, nothing was said as to permanency of tenure or otherwise in Clause 10, relating to the appointment from time to time of medical officers of health.

When the Bill was in Committee, July 18th, 1872, Colonel Barttelot moved as an amendment the addition of the words (*Hansard*, July 18th, 1872, p. 1,391) "whose several appointments shall be for a period not exceeding five years, but nothing in this Act shall prevent such officers from offering themselves again for re-election. This would enable boards of guardians to have some power over these officers of health, and would prevent them from doing as they pleased, etc."

Mr. Stansfeld acceded to the amendment "on condition of its applying only to the first appointments under the Act. The functions of the officer being a matter of experiment, it was not desirable to make the first appointment permanent."

Sir M. Hicks-Beach objected to the amendment, "thinking that a five years' officer like an American President would be afraid of displeasing those on whom his re-election depended."

Colonel Barttelot "was not satisfied with the modification proposed by the hon. gentleman; was it to apply to the first five years of every officer's tenure, or to the first five years after the passing of the Act?"

Mr. Corrance said the amendment "would reduce the Bill to a nullity by impairing the independence of the medical officer."

Mr. Stansfeld "should have preferred at this moment not to have legislated on this subject, but was willing to accept the amendment . . . so modified as to make the first appointments under the Act tenable for five years only, leaving the question of their permanency open for future decision."

Mr. Corrance would prefer the Bill as it stood.

Colonel Barttelot would gladly accept the modification of the right hon. gentleman, if it were understood that the first appointments under the Bill were not to be permanent.

Amendment proposed, to insert the words in Clause 10 "the appointment of the medical officers of health first made after the passing of this Act shall be for a period not exceeding five years."

After further remarks by Mr. Peel, Mr. Hibbert, and Sir Massey Lopes pointing out that the amendment should apply to the appointments of inspectors of nuisances as well as to medical officers of health, the words "and inspectors of nuisances" were inserted after "medical officers of health."

Amendment as amended agreed to.

Clause as amended ordered to stand part of the Bill.

Bill read third time, August 7th.

EXTRACTS FROM ACTS OF PARLIAMENT AND ADMINISTRATIVE ORDERS CONCERNING THE APPOINTMENT OF MEDICAL OFFICERS OF HEALTH.

'THE TOWNS' IMPROVEMENT CLAUSES ACT, 1847.
(10 and 11 Vict. c. 34.)

Section 12.—The Commissioners may, if they think fit, appoint, subject to the prescribed approval, or, where no approval is prescribed, subject to the approval of one of Her Majesty's Principal Secretaries of State, 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 within the limits of the special Act, especially epidemics and contagious diseases, and to prevent any nuisance 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 within the limits aforesaid; and also the best means for the ventilation of churches, chapels, schools, registered lodging-houses, and other public buildings, within the limits aforesaid; and from time to time as required by the Commissioners, to report to them on the matters aforesaid, and to perform any other duties of a like nature which may be required of him. And the Commissioners, with the same approval, which is necessary for the

appointment of the officer of health, shall fix the salary to be paid to such officer, and shall pay such salary out of the rates to be levied under this or the Special Act; and the Commissioners, with the like approval, may discontinue such officer, or remove any such officer of health.

*POWERS OF THE LOCAL GOVERNMENT BOARD WITH RESPECT TO THE APPOINTMENT, TENURE OF OFFICE, &c., OF POOR LAW MEDICAL OFFICERS.

(4th and 5th William IV., Cap. 76, Sec. 46.)

(*In force.*)

And be it further enacted that it shall be lawful for the said Commissioners (now the Local Government Board), as and when they shall see fit by Order under their hands and seal to direct the overseers or guardians of any parish or union, or of so many parishes or unions as the said Commissioners may in such order specify and declare to be united for the purpose only of appointing and paying officers to appoint such paid officers with such qualifications as the said Commissioners shall think necessary for superintending or assisting in the administration of the relief and employment of the poor . . . and the said Commissioners may and they are hereby empowered to define and specify and direct the execution of the respective duties of such officers and the places or limits within which the same shall be performed and direct the mode of appointment and determine the continuance in office or dismissal of such officers . . . and when the said Commissioners may see occasion to regulate the amount of salaries payable to such officers respectively and the time and mode of payment thereof . . .

MEDICAL APPOINTMENTS ORDER.

(Dated 25th May, 1857.)

(*In force.*)

Article 1.—Every medical officer of a workhouse, duly qualified at the time of his appointment, according to the regulations of the Poor Law Board then in force, shall hold his office until he die, or resign, or be proved to be insane, by evidence which the Poor Law Board shall deem sufficient, or become legally disqualified to hold such office, or be removed by the Poor Law Board.

Article 2.—Every district medical officer, duly qualified as aforesaid at the time of his appointment, and then being, or within two months after his appointment, becoming resident within the district for which he shall be appointed to act, shall hold his office until he shall die, or resign, or be proved to be insane, in the same manner as in the previous article;

or become legally disqualified to hold such office, or be removed by the said Board, or cease to reside within such district.

Article 5.—Where a change in the extent of the district of a medical officer shall be deemed necessary for the more convenient supply of medical relief to the poor, or otherwise for the general benefit of the Union or Incorporation, and he shall decline to acquiesce therein, the Guardians may, with the consent of the Poor Law Board, but not otherwise, and after six months' notice in writing, signed by their clerk, given to such medical officer, determine his office.

³LOCAL GOVERNMENT BOARD ORDER.

(Dated 11th November, 1872.)

Section III.—Tenure of Office.

Medical Officer of Health.

(*Repealed.*)

Article 1.—Every officer appointed under this order shall continue to hold office for such period as the sanitary authority or authorities appointing him may, with the approval of the Local Government Board, determine, or, until he die, or resign, or be removed, by such authority or authorities with the assent of the Local Government Board, or by the Local Government Board.

Provided that the appointments first made under this order shall not be for a period exceeding five years.

Article 2.—Where any such officer shall be appointed for one or more sanitary districts, and any change in the extent of those district or districts, or in the duties, salary, or remuneration, shall be deemed necessary, and he shall decline to acquiesce therein, the sanitary authority or authorities by whom he was so appointed may, with the consent of the Local Government Board, but not otherwise, and after six months' notice in writing, signed by their clerk or clerks, given to such officer, determine his office.

⁴LOCAL GOVERNMENT BOARD ORDER.

(Dated 23rd March, 1891.)

(*In force.*)

Article 10.—Every (medical) officer (of health) shall continue to hold office for such period as the sanitary authority may, subject to our approval, determine at the time of his appointment, or until he die, or resign, or be removed by such authority with our assent, or be removed by us, or be proved to be insane by evidence which we shall deem to be sufficient.

Article 12.—Where any change in the duties or salary of any officer may be deemed necessary, and he shall decline to acquiesce therein, the sanitary authority may, with our consent, but not otherwise, and after six months' notice in writing, signed by their clerk, given to such officer, determine his office.

GENERAL ORDER OF THE LOCAL GOVERNMENT BOARD—AMENDMENT OF CONSOLIDATED AND OTHER ORDERS.

(Dated 12th February, 1879.)

(*In force.*)

Article 1 (1).—Every master, matron, schoolmaster, and schoolmistress of a work-house, and every relieving officer appointed after the twenty-eighth day of February, 1879, shall continue to hold office until he or she die, or resign, or be dismissed by the guardians, subject to the consent of the Local Government Board, or be proved to be insane by evidence which that Board shall deem to be sufficient.

Provided that the guardians may, with the like consent, determine the appointment of any such officer at any time before, or at the expiration of the first year of his or her service, by giving to the officer three months' previous notice in writing, signed by their clerk, of such their intention.

INFANTILE MORTALITY IN PAISLEY.—Although Paisley compares favourably with other towns in the matter of infant mortality, the number of deaths might be considerably reduced. It is safe to say that fully one-third of the deaths of children under one year of age could be prevented. These deaths are due to want of knowledge on the part of the mother, of the elementary principles of infant and domestic hygiene, resulting chiefly in improper feeding and unsuitable clothing. Last year the deaths from disease of digestion and lung troubles formed over 35 per cent. of the total deaths under one year. The remedy is to educate the mothers, and this can best be done by competent and sympathetic lady visitors who will visit, at intervals, houses where a birth has occurred, and give advice and instruction in the feeding and care of infants. We must also educate those that are to be the parents of the future. All girls, before they leave school, should be well trained in domestic economy and hygiene. It is easier to inculcate into young children habits of cleanliness and the elementary laws of health, than to eradicate from people's minds wrong ideas and old superstitions. "Poverty and ill-health of the parents may have much to do with the loss of many infant lives, but the abuse of alcohol, with its resultant carelessness and neglect of family duties, is responsible for the loss of many more."—*From the Annual Report for 1907, to the Burgh of Paisley, by the Medical Officer of Health, Dr. Alex. Robb.*

SCHOOL HYGIENE IN MANCHESTER.

Extracted from the Annual Report of the Education Committee of the Manchester Corporation for the Year 1906-7.

A NEW departure has just been made in connection with the municipal schools by the establishment of a cottage centre for the teaching of housewifery. For years such a course has been successfully taken by girls at the Manchester Jews' School. Provision has now been made in two cottages belonging to the Committee in St. Mary's Road, Newton Heath. These houses have been simply furnished and equipped with the cookery utensils, etc., suitable for a working-class house. The teacher lives in one of the houses, and classes of twelve girls at a time are taught. All the practical details of household management are dealt with, including the buying and cooking of food, bread-making, mangling, and washing of clothes, cleaning, dusting, etc., and all the other details of household management. By means of this provision about 120 girls in Newton Heath Schools will have the benefit of practical training, and in time there will be simple lessons given in hygiene and the tending and feeding of young children. If the Committee are encouraged by success in this new departure there will no doubt be similar provision made in various other parts of the city. To meet the Government requirements it is necessary that each girl admitted to the housewifery centre should have previously gone through a course of lessons in cookery and laundry work. If the last six months of a girl's life at school could be spent at such a centre, in training for the duties of keeping the home, there can be no question but that a vast improvement would be effected in the comfort and economy of home life, and such provision would have a tendency to prolong the school life of the girls of the public elementary schools.

Feeding and Tending of Infants.—About five years ago the School Board appointed Miss M. G. Taylor to lecture to the children of the public elementary schools on the nursing, feeding, and tending of infants, and the work has been most efficiently carried on.

During last year Miss Taylor gave a course of lectures to the girls in Standards V and upwards in seventy-seven schools, the number of girls amounting to 5,815. The course includes six lectures, and at the conclusion the girls write out an account of the lessons. Some of the papers written were extremely creditable.

It takes about eighteen months for Miss Taylor to cover the whole of the schools, and with a view to bring this within the year the committee some time ago decided to appoint a second teacher. There has been some difficulty in obtaining a woman who, by her education and practical experience, is exactly fitted for the post.

The committee, however, have no doubt that before long they will find a suitable woman, and an opportunity will then be given to every girl in the upper standards of receiving this valuable instruction before leaving school.

Physical Exercises.—Under the control of the committee's instructor of physical exercises there is now applied to the whole of the children attending the public elementary schools an approved course of drill and physical exercises taught by class teachers. The scheme has been in operation about five years, and has proved an entire success by contributing greatly to the health and improved physical conditions of the children. Each year classes are carried on out of school hours for the training of the teachers, and altogether the lessons have provided an efficient training in the various exercises contained in the scheme, which is so administered as not to produce an undue strain upon the strength of those who are under instruction.

Bathing of School Children.—The Baths Committee of the Manchester City Council Public Elementary Schools admit children over seven years of age free to the second-class swimming baths any week day, except Saturday, when in charge of a teacher.* The season extends from April to September, 8 a.m. to 4.30 p.m., and from October to March, 9 a.m. to 4.30 p.m.

The number of visits paid by school children to the public baths has increased from 133,152 in 1897 to 573,599 in 1907. In thus affording to school children opportunities of cultivating the habit of personal cleanliness, the Baths and Wash-houses Committee render very valuable assistance to the work of the Education Committee.

In regard to the teaching of swimming, it is a pleasure to be able to record the very valuable help which the Royal Humane Society for the Hundred of Salford continue to render by the presentation of badges for competition in the schools.

Country School.—The country school for Manchester children (situated at Mobberley, twelve miles from the city) is still carried on by the Voluntary Committee, and has had a most successful season during the summer of 1907. As explained in previous reports, this school, the only one of its kind in the country, was established through the generosity of the late Mr. Herbert Philips four years ago. During the past year proposals have been approved by which the freehold of the site is to be transferred to the City Council, and the present site of five acres extended to ten acres. This has been rendered possible through the generosity of the David Lewis Trustees, who own the land. The council are to have the option of purchasing the entire ten acres at a most reasonable cost. During the year there have been considerable extensions carried out, partly at the cost of the Education Committee, and partly through the generosity of Mrs. Herbert Philips and other friends, who contributed towards the provision of spray baths and other improvements. The dormitories have been extended so as to accommodate 128 beds. New domestic offices and a teachers' sitting-room, in brickwork, have been added to the corrugated iron building erected by

*The use of token tickets and the rule as to attendance of teachers was temporarily suspended during the midsummer holidays of the schools, so as to allow of children making more frequent visits to the baths.

Mr. Herbert Philips. Water has been laid on from the Stockport Corporation mains, and many improvements tending to perfect the sanitary condition of the school have been completed.

The entire premises now consist of:—

Two dormitories (with sixty-four beds in each), each being commanded by a window in a teacher's room.*

Six single bedrooms for the staff, including the teachers.

Two cloak-rooms.

One boot-room, with a locker for each child.

One sitting-room for the matron.

One sitting-room for the teachers.

One dining-room for seating accommodation for 150 children.†

A special bathroom with ten shower-baths, with hot and cold water supply for each child—foot basins in separate compartments. In this room there is also an ordinary bath for the staff. A dressing-room adjoins the bathroom.

The sanitary arrangements consist of pail closets, and the waste water from closets, bath, etc., is pumped on to the garden land.

The lavatory is an open shed in quadrangle of main building, where the children wash in bowls on wooden tables.

There is an ample playing field of about three-and-a-half acres of grass, provided with swings, etc. It is on this playing field that the tents for the extension of the accommodation have stood during a part of the summer.

The instruction and control of the children is undertaken by the teachers who accompany the various batches (one teacher to forty scholars), the teachers belonging to the day schools in Manchester ordinarily attended by the children. Of course, the salaries of these teachers, paid by the Education Committee, run during the period of residence in the country school.

The staff consists of matron and assistant, two women servants, and two men.

The dietary is unrestricted, and with slight modifications is as follows:—

Breakfast (8 a.m.): Porridge with milk and sugar (three or four days a week.) Milky tea, cocoa, or pure milk. Bread and butter *ad lib.*

Dinner (12 noon): Soup containing meat, or meat (½ lb. provided for each child) with potatoes and one vegetable *ad lib.* Pudding daily (milk, currant, and raisin, treacle, tarts, and stewed fruit).

Tea (4.30): Bread and butter. Milk, or milky tea. Jam, treacle, and cake alternately.

(7.30): Slice of bread and butter and half-pint of milk.

Each scholar has three-quarters of a pint of milk daily.

The time table is as follows, but is subject to

variations according to the weather, etc.:—

6.45 a.m.	Rise.
8 „	Breakfast.
9.12 „	School (in schoolroom).
12 noon	Dinner.
4.30 p.m.	Tea (or later on return from excursion).
8 „	Supper.
8.30 „	Bed.
9 „	Lights out.

The following additional particulars will be of interest. The school receives relays of children during the summer (April to October) from the public elementary schools, principally of the poorer districts of Manchester. Each batch of children stays for a fortnight. They are accompanied by their ordinary day school teachers, and are boarded, lodged, and taught during the period. Prior to admission, the children are invariably inspected in Manchester by the medical officers of the Education Committee, and through information in the hands of the School Attendance Department a clean bill of health for at least one month prior to admission is secured. There is no break whatever in the continuity of the teaching. The school is thoroughly equipped with all needful material for instruction, and the ordinary routine of the town school is continued. Actually nothing is changed save the local habitation of the children, and such alterations in the time table as are necessary to secure to the children the complete benefit of their rural surroundings.

The scheme for the establishment of the country school was approved by the Board of Education some three years ago, and permission was given to reckon the attendances made thereat in connection with the town schools from which the children are sent.

During the period in which the school was open this year, about 1,600 children and teachers have been received.

Each child pays the sum of 7s. for the fortnight's stay, and this includes the charge for railway fares to and from Mobberley. The balance of the cost, establishment charges, etc., is met by voluntary contributions.

The success of the experiment has been unmistakable. The scheme would have been fully justified if it did no more than provide the children once a year with a complete change of environment, for it must be remembered that for the bulk of these children there is no other possibility of a yearly holiday from home. Most of them are hopelessly debarred from the advantages to body and mind which come of such a change.

But much more than the simple provision of a holiday is undertaken. The children benefit by the orderly routine of a well-arranged home. Besides being under daily instruction, they are well fed and most comfortably housed—too often in marked contrast to their feeding and housing at home. They are brought into touch with the influences of country life, and under skilful direction are taught some understanding and

appreciation of the beauties of nature, not under any conditions to be learnt in their home surroundings.

That the children benefit both in body and mind by their residence at the country school is the experience of all who come into contact with them. Having testimony to this effect on all hands from managers and teachers, and from the medical officers, the Manchester Education Committee have heartily supported the work of the Country School Committee, and have done everything in their power to make the operations effective, and extend them to as large a number of children as possible.

MEDICAL INSPECTION.

Skin Diseases, etc.—During the past year considerably more has been done with regard to the presence in our schools of children suffering from ringworm or having verminous heads. A number of children have been sent to hospital for the treatment of ringworm, and the task of eradicating grossly verminous cases have been begun, a large number of cases having already been dealt with. The number of cases of ringworm affecting school children and treated at the Skin Hospital within the last twelve months was about 300. Leaflets containing information with regard to ringworm, infectious sores, itch, and vermin, and special forms for exclusion of children suffering from those complaints, have been drawn up, and are now in use. The children affected are excluded for definite periods. Parents are supplied with information regarding the complaints, and the attendance officers follow up the cases and endeavour to ensure adequate treatment.

Eyesight.—During the last school year the number of children whose eyesight was tested is 32,614, and of those, 2,037 were found to be suffering from defects of such gravity as to warrant the parents being notified. The scheme for the supply of glasses in cases where the parents were unable to pay the cost, or could only afford part of it, has been in operation throughout the year, and 384 pairs of glasses were so provided. It having been found, that in many cases through indifference, neglect, or prejudice, the parents had not, even after having had circulars sent to them repeatedly, taken any steps to have their children's defective vision remedied, an attempt was made through the attendance officers to induce such parents to take action.

The outcome of this work was fairly satisfactory, and the application for provision of a large number of pairs of glasses followed immediately after the visitation. There are, however, a large number of cases in which no amount of persuasion appears to have any effect, and the question arises as to whether cases of marked defect should not be excluded from school and further action taken. Although the weather interfered very greatly with the eyesight testing during the spring and summer months, an attempt was made to mitigate the pressure put on the honorary staffs at the eye hospitals through the influx of large numbers of children in short periods. This was found possible by arranging for the testing being made in alternate districts, by so wording the circulars that the

children attended at different hospitals and on definite days, and by the spreading of attendances of children over a much longer period. The number of cases of defective *near* vision reported during the last year was again unsatisfactory, but steps have been taken to ensure in the future a proper return of children with this defect.

Hearing.—Hitherto the returns of children suffering from defective hearing have been comparatively small, and although the method of dealing with such cases has been organised and in work, it has been beyond the power of your medical officers to deal adequately with this matter. This year, however, a further step has been taken, and from the lists now sent in there is evidence that a much larger number of children will have to be tested. During the past year 999 were reported as suffering from defective hearing, and of these, in 316 the defects were so grave as to warrant the notification of the parents. As in previous years, a large number of the remainder had their ears blocked with wax, and in the majority of cases the advice by the teachers to the parents was sufficient to bring about proper attention to the matter.

Absentees.—The number of absentee scholars referred to your medical officers for examination continues to grow. These children are brought to the office by the attendance officers on Saturdays, and are mostly cases in which there is no medical certificate, or in which the attendance officers have some doubt as to the validity of the excuses given, while some have been referred by the rota. A record of such cases is now being kept, and out of eighty-seven so recorded since January 1st, twenty-one were certified as being fit for attendance at school at once, ten were certified fit after a period of a few days, and the remainder, from various causes, were either exempted for an indefinite period or until further report, or, as in cases of pronounced phthisis, etc., taken off the books.

Provision of Meals.—Early in the current year the provision of meals for ill-nourished or necessitous children was undertaken by the Education Committee, and your medical officer was requested to examine and certify all such cases. Meals have been provided in seven centres, covering forty-three schools, with an aggregate average attendance of 25,759. All the children in these schools have been inspected by your medical officer, 1,511 have been selected and personally examined, and tickets for meals have been issued to 1,208. Of this number the parents of 1,026 have accepted the provision of food. In a large number of cases where the food was not accepted it was found that, although the children were badly nourished to a marked extent, the income per head of the family was adequate for their proper nourishment. The question of compulsion in such cases is a difficult one, on account of the many factors in the production of a badly nourished child. The routine now followed is that the teachers provide lists of children whom they consider proper cases for the provision of meals. The children so selected, with any further cases found on inspection, are then individually examined by the

* By means of tents the number of children was extended during the middle of the summer to 250-125 in the dormitories and 132 in the tents.

† During the summer months the meals are served in a covered playground, and here it is possible to seat 250 children at one time.

medical officer, who at the same time elicits such information as is possible regarding the home conditions, etc. Some urgent cases are provided with tickets at once, but the majority are referred for investigation through the attendance officers. The attendance officers' reports and the medical officers' notes are then compared, and tickets issued to those found eligible. The following table shows the attendance at the various centres. The numbers will no doubt be largely increased as the winter advances, and with the opening of fresh centres to cover that portion of the poverty area not yet provided for:—

Name of Centre.	Previous to Summer Holidays.		Number (Sept. 30, 1907).
	Highest Number.	Lowest Number.	
Albert Street ...	47	14	33
All Saints' ...	60	26	63
Chorlton Street ...	50	26	44
Great Jones Street	88	36	103
Mill Street ...	42	24	67
New Islington ...	161	82	164
Shakespeare Street	38	14	35

The diet provided for the children is, while inexpensive, both nourishing and palatable, due regard having been paid in each day's diet to the constituents necessary for the provision of a satisfactory meal. The children are at present provided with an alternation of eight varieties of diet. Your medical officer is in a position to assert from personal observation, and from the reports of the teachers, that the provision of meals to badly nourished children has in many cases already resulted, not only in improved physical condition, but in the raising of the standard of the children's capability for school work, of their powers of attention, and of their amenability to discipline.

Lectures on Hygiene to Pupil Teachers.—The course of lectures given by your medical officer to the pupil teachers were continued this year. The number of students attending the course was 104, and these were divided into two classes. Each division attended a course of thirteen lectures, and each pupil was provided with a set of notes and diagrams explanatory of many important items in the course of instruction, and with a copy of your medical officer's "Notes on Hygiene for Teachers," printed by the committee in 1905. Each pupil received in addition, as a guide to the lectures, a syllabus of the course printed by the committee last year. As previously explained by your medical officer, the syllabus was drawn up for a course of twenty to twenty-four lectures, and deals

with subjects considered necessary for the imparting to students of the amount of knowledge adequate to render them efficient aid in the medical supervision of schools. Hitherto it has only been found possible to arrange for twelve or thirteen lectures of one hour's duration. As reported last year, your medical officer is of opinion that a course of at least twenty lectures is necessary. The pupils have had no previous tuition which would enable the lecturer to eliminate some of the preliminary knowledge necessary for the understanding of the lectures on hygiene proper, and the time available in a course of twelve lectures is quite inadequate. In view of the fresh development in medical inspection of schools which will undoubtedly take place in the near future, and of the extreme value of teachers both in minimising the cost and increasing the efficiency of such inspection, your medical officer would again strongly urge that due provision be made for the proper carrying out of this work, which he considers of urgent importance.

Lectures to Parents and Teachers.—During the last year permission was given to your medical officer to make the experiment of giving a series of addresses to parents. The meetings to be organised by the teachers and held in the school buildings, and the addresses given by the medical officer. Three such addresses were given during the last winter, and in each case, owing to the enthusiastic work of the teachers, the meetings were eminently successful. The numbers of parents attending, of exactly the class desired, were very satisfactory, and the reports by the teachers of the result of the addresses have been highly gratifying. It is proposed to continue the series during the coming winter. Your medical officer has been requested by many teachers to repeat the course of lectures given to teachers in 1904, and should applications be received in a sufficient number this work will be again taken up.

Stammerers.—During the last year your medical officers have examined ninety-six and submitted for treatment eighty-four stammerers, who were dealt with in eight classes, conducted by Miss Clay and her assistant (Miss Atkinson), and your medical officers have been highly satisfied with the successful result of these courses.

Special Investigations.—Your medical officers have conducted an investigation with regard to the condition of the teeth of the children attending Duke Street Girls' School and St. Mark's Boys' School. Investigations have also been carried out with regard to the physical measurements, state of health, mental ability, and home conditions, etc., of the children attending the following schools:—St. Peter's, Bengal Street; St. James-the-Less and St. Michael's, Ancoats. This work has been completed at too recent a date to allow of a full report on the results, but a few of the facts already extracted from the records made may be interesting.

Teeth.—The teeth of 508 girls attending Duke Street School were examined, and it was found that

of these 439 had one or more decayed teeth. The average number of decayed teeth per child is 2·8, and the incidence of the numbers of decayed teeth and the number of children with nutrition below the normal are shown by the following table:—

NUMBER OF GIRLS WITH DECAYED TEETH.

Number of decayed teeth ...	1	2	3	4	5	6	7	8	9	10	11	12	13
Number of girls ...	93	89	85	83	42	21	7	9	4	1	3	1	1
Nutrition below normal ...	23	16	18	11	9	4	1	1	—	—	1	—	—

NOTES ON THE MIDWIVES' ACT.

THE question of *Supply of Midwives* is the chief topic of action in the philanthropic bodies associated with midwifery, it being feared that through lack of sufficient certified midwives either the enforcement of the Act in 1910, prohibiting the practice of uncertified women, will cause suffering to poor women, especially in scattered districts; or the Act will be allowed to become a dead letter; or an Amending Act will be introduced, postponing the operation of the Act. It is contended that the latter will postpone indefinitely the incentive to the provision of midwives, and, if the Act be not amended, it is obviously essential to the efficiency and credit of local government that it should not be allowed to become a dead letter.

It is not always realised that these philanthropic bodies, having their headquarters in London, can only be in touch with those districts that are represented on their associations or are in a position to bring the needs to the association's notice; that, in short, they cannot reach many of the districts that are most in need of midwives and have no "Lady Bountiful" or active M.O.H. to take up their cause. A policy of decentralisation is therefore needed.

The establishment of *County Nursing Associations* meets this need and is a policy much to be commended and supported by ourselves. That nursing is of value to the individual health, that it offers a large and suitable field to the employment of women, that it is of considerable importance, especially as an educational factor, in the promotion and maintenance of the public health, are axioms that require no proof. Local authorities require an authoritative body with which to deal in approaching working questions and from which to learn facts collectively and in proportion. In the matters of midwifery and of school health, in which nursing can most assist local administration, the local authority is the County Council. The area for the representative body of nursing should similarly be the county.

This policy has been actively promoted by the Queen Victoria's Jubilee Institute for nurses, which now reports the existence of eighteen such County Associations in touch with the Institute.

So far as the analysis of the investigation has been carried out, your medical officers are unable to state that the condition of the teeth is necessarily reflected in the physical condition of the child, but further investigation of this point is required.

The Institute is sometimes able to make a grant toward the early expenses of such associations and is at all times ready to assist with information or otherwise in the formation of new associations. Its area includes Great Britain and Ireland; its offices are at 120, Victoria Street, London, S.W.; 29, Castle Terrace, Edinburgh; and 12, Upper Pembroke Street, Dublin; and it employs six inspectors for England, one for Wales, and superintendents for Scotland and Ireland, with a general superintendent in Miss Amy Hughes at their head.

The Institute recognises two types of nurse—the fully-trained Queen's nurse, costing a local association from £85 to £100 a year, and the village nurse, with a year's training in midwifery and general district nursing, at an annual cost of from £45 to £60. In the Report for 1907, the Institute records the work of 600 local associations in England, Wales and Ireland, and 200 in Scotland, employing 1,500 Queen's nurses, as well as a large number of village nurses.

The establishment of county nursing associations may well engage the attention of county medical officers, who will find little difficulty in arousing the interest of the leading county ladies for a scheme to serve an obviously benevolent and useful purpose.

The advance made by the nursing profession in public recognition is evidenced by two Bills before Parliament this session. The Bill for State Registration, introduced into the House of Commons, has not yet been discussed. "The Official Directory of Nurses Bill," however—Mr. Sydney Holland's Bill—was introduced into the House of Lords by Lord Balfour of Burleigh, who moved the second reading on May 6th. The proposed directory was to be compiled from official sources giving such particulars as the Privy Council might think necessary. Every nurse, except those only trained in an institution carried on for private gain, would be entitled to have his or her name entered. The number was estimated at from 40,000 to 60,000. Lord Amthill moved the rejection of the Bill, as being a red herring drawn across the track of State Registration, and the second reading was lost by fifty-three votes to twenty.

There can be little doubt that The Midwives' Act is only the first step in the establishment of

the nursing profession, and that nursing and midwifery play a most useful part in the community, a part to some small extent hitherto included in the rôle of the general practitioner. The general practitioner will to some extent lose, to some extent gain by the increasing use of nurses and certified midwives; they constitute at least a distributing element in his practice. The most reasonable and dignified attitude for the medical profession to adopt is to recognise this tendency of civilisation, and, in order to define the responsibilities and status of the rival order in the other sex, to do their utmost to promote the State Registration of all nurses. This policy gives medical officers of health a clear line to take up, when confronted with the difficulties often being raised by Rule 18 of the Central Midwives Board.

A recent instance of failure in co-operation between midwife and practitioner, reported by the Inspector of Midwives in Norfolk, is a blot both on local government and on the medical man. The latter refused to attend a woman in her approaching confinement, owing to non-payment of fees on a previous occasion, and recommended the local midwife. In the ensuing confinement dangerous symptoms developed, and at 8 p.m. the midwife sent for the doctor, who refused to go. The messenger went seven miles to another doctor, who similarly refused because the fee was not assured. Time 11.30. The messenger was sent back to the first doctor who was absent. Time 2.30; patient sinking fast. An urgent message at last fetched the first doctor at 4 a.m. The patient died at 4.30.

Medical men and above all medical officers of health, with their greater influence on local government, must formulate both personally and collectively an active campaign amongst Boards of Guardians until they have consented to assure the fee in the first instance to medical men thus called in by law. Should the patient be able to pay, it is not the medical man's duty to act as a collector of public monies. But, meanwhile, practitioners are neglecting their first duty if they imperil the lives of patients by refusing to attend on the summons of a midwife.

DIRTY MILK.—"In some cases both the milker and the cow are at fault, and in most cases cleanliness seems to be an unrecognizable quantity. Where separators are used, the amount of dirt and filth, which is deposited on the separator, is quite large in amount, so that those who use separators hold the argument that separated milk must be cleaner than unseparated; but they forget that the dirt, etc., should never have been there, with all its attendant microbes, placed in a most suitable medium for growth and so on. But it is the fresh milk which constitutes the greater danger, being what most inhabitants use as one of the principal articles of diet, and in young children often the only article of diet."—*Extract from Annual Report, 1907, by Dr. Robert McLay, M.O.H., Horncastle U.D.*

CORRESPONDENCE.

THE COMMUNICABILITY OF PHTHISIS.

To the Editor of PUBLIC HEALTH.

SIR,—There is a seeming incongruity in the facts that the experience gained at the Crossley Sanatorium was recently appealed to by Professor Pearson, in his research on the hereditary transmission of proclivity to phthisis, and that Manchester figures (obtained in the main from the same raw material) are now being cited by Dr. Niven* in proof of the importance of direct case-to-case infection. On this phthisis question there are, as in Verona of old, Montagues and Capulets; and both, like Tybalt, "fight by the book of arithmetic." The house of Montague holds that "the discovery of the possibility of phthisical infection has led to the under-estimation of the hereditary factors." The house of Capulet makes complaint concerning the "manner in which the facts relating to the infectiousness of phthisis have been marshalled" by Dr. Bulstrode in his recent report, and appeals to statistical evidence of transmission of infection from husband to wife. Those who try to follow the arguments used, and who find that quite opposed conclusions are arrived at as result of exploitation of practically the same material, may perhaps be pardoned if they exclaim, "A plague o' both your houses!"

Dr. Niven, in the paper referred to, gives the result of an investigation in Manchester concerning transmission of infection in married couples. In making this inquiry he has kept steadily in view the "demand" of Dr. Longstaff that, before any presumption can be raised, it must at least be shown (for England and Wales) that more than one in every thirty-four of the partners of consumptive mates die from phthisis. Dr. Niven obtains in Manchester a proportion of 1 in 12.6, and thereupon claims that Dr. Longstaff's "demand is more than fulfilled."

Dr. Longstaff used figures obtained in the decade 1871-80. He was, moreover, dealing with fatal cases, and, apparently, Dr. Niven's inquiries were not thus restricted. Hence a history of consumption may bring a particular partner into Dr. Niven's statistical net, and this partner may recover or die from some inter-current malady—circumstances which would necessarily involve escape from the net of Dr. Longstaff. The figures are, as Dr. Niven says, "not quite comparable."

A far more important consideration is this. Dr. Longstaff dealt with England and Wales; Dr. Niven takes a selected portion—that furnishing his voluntary notifications—presumably, in the main the most poverty-stricken portion of Manchester. This portion yields, it appears, rather more than half the total number of phthisis deaths in Manchester, some 600 annually, while some 500 are supplied by the rest of the city. There are thus two Manchesters—

1. A poverty-stricken Manchester, made up almost entirely of those who, when they are ill, gravitate into workhouse infirmaries, hospitals, etc., presumably numbering (judging by the recorded deaths and the probable phthisis death-rate in this poverty-stricken class) about 100,000 persons in all.
2. The rest of Manchester, far less phthisis-ridden than the above, presumably numbering (again judging by deaths and the probable phthisis death-rate) about 500,000 persons in all.

Roughly, the Manchester of Dr. Niven's cases seems to be one-sixth of the population of the city. Now, in this one-sixth, we are told, 381 instances of apparent infection between married partners were traced in inquiries bringing within their scope 4,784 couples

* "The Communicability of Phthisis." May number of PUBLIC HEALTH.

having at least one member infected (i.e., 1 in 12.6). On the hypothesis that chance, and chance alone, is here in question, it is clear there would be a much smaller incidence in the case of similar couples belonging to the remaining five-sixths of Manchester, for in this last-named population there is far less disease, and, therefore, far less likelihood of this particular association of sufferers being observed than in the phthisis-ridden one-sixth of Manchester. Roughly, it may be hazarded that the corresponding proportion, instead of being 1 in 12.6, is, in the rest of Manchester, more like 1 in 50, or even 1 in 100. Taking the two Manchesters together, the proportion is not likely to differ so greatly after all from that of the Longstaff "demand"—viz., 1 in 34.

In illustration, the figures relating to two selected London districts may be cited. Mr. G. H. Day has kindly calculated for me that in Hampstead, with a well-to-do population and a low phthisis mortality—and dealing with rates of recent years, not those of 1871-80—the Longstaff "demand" is 1 in 118; while in Holborn, with a phthisis death-rate nearly four times that of Hampstead, the corresponding "demand" is 1 in 34.

A statistical inquiry of the sort here in question, relating to a poorer and a well-to-do population, is thus complicated by dissimilarity in the phthisis death-rates. Furthermore, in contrasting the poverty-stricken parts with the rest of a town, there are many other circumstances which accentuate the "non-cæteris-paribus difficulty." The following is an extreme instance of the kind of argument which might be put forward, were it unquestioningly assumed that other things are equal in such cases. In poverty-stricken Manchester, considerably more than one-third of the cases of phthisis are "Poor-Law cases." In England and Wales the corresponding proportion is certainly far less. Dr. Wheatley, who is quoted by Dr. Bulstrode (p. 244 of his report), states that probably the deaths from phthisis in Shropshire workhouses amounted to under 6 per cent. of the total deaths from phthisis in Shropshire. Hence, if a possible causal relationship of life in workhouses to the production of phthisis were being considered, it might be argued that a Longstaff "demand" (based on an England and Wales estimate) fixed, let us say, 10 to 20 per cent. for the proportion of deaths occurring in workhouses to total deaths, and that this estimate was found on actual inquiry to be greatly exceeded in poverty-stricken Manchester. Thereupon it would, perhaps, be inferred that phthisis was due in the main to residence in workhouses—a conclusion which of course is absurd.

To take another illustration, one is on a first view rather attracted to an hypothesis that the house spider may be an intermediate host concerned in the spread of phthisis (the presence of tuberculosis in poultry pens and cowsheds, and again among animals and men in captivity, or under allied environmental conditions, falls in with such a suggestion). Now this hypothesis might, it may be conjectured, judging from what is known of the association between spiders and dark and dirty rooms, find just as much and just as little support on instituting a comparison between an England and Wales "demand," and the result of actual inquiry in poverty-stricken Manchester, as does the hypothesis of direct case-to-case infection.

In fact, to go at once to the root of the matter, when we pass from England and Wales to poverty-stricken Manchester, we "differentiate and draw into an inner circle"—a circle of more phthisis; and at the same time a circle of cheaper milk (much of which is probably tuberculous), worse food, more alcohol, gloomier and more ill-ventilated habitations, more dirt, less physical resistance, more hereditary proclivity, a large number of possible insect, arthropod, or other intermediate hosts, and a large number of many other things, among which, if not among those enumerated, lurk the

causal agencies specially concerned in the production of phthisis. One school concentrates its attention upon hereditary proclivity, another upon dust-borne bacilli, but each, when it "differentiates and draws into its inner circle" of poverty-stricken Manchester, is followed up by every one of the associated conditions above specified, greater hereditary proclivity, and a higher double incidence upon husband and wife—these, as a matter of course, go without saying; there follow further the squalor, poor food, and the rest; these, even draw into the inner circle the appropriate excessive number of flies, fleas, bugs, lice, cockroaches, and spiders. *Quis separabit?* From solution of the all important question "If communicable, how communicated?" we are as far off as ever.

Yours faithfully,
W. H. HAMER.

Highgate, May 12, 1908.

THE REFERRING OF DEATHS TO DISTRICTS.

To the Editor of PUBLIC HEALTH.

SIR,—I should like to make a few comments in the Journal anent the growing custom, on the part of medical officers of health, of referring deaths occurring in their districts to other districts, when, for one reason or another, the person dying appears to have belonged to that other district. In some districts a letter-form has been adopted, with blanks to be filled in with the name of the person dying, cause of death, etc., and these are posted, upon the receipt of the week's death returns from the registrar, to the medical officer of health of that district to which the death purports to belong. I presume that, generally, the registrar has been asked to ascertain from the persons registering the death to what place the person that has died belongs.

As apart from persons dying in institutions, and whose domicile is easily ascertained, this being usually not far removed from the district in which the institution is situated, it seems to be very hazardous, and not likely to lead to correct statistics, to attempt to refer all deaths to the places to which they are stated to belong upon evidence gained as above indicated.

As absurd instances of deaths being formally referred to this town, I may mention the death of an army captain, who belonged to this town in the sense that his parents lived here, although he left it upon entering the army school many years previously, and had never been here since excepting upon an occasional visit. Another, is that of a person who died at an advanced age in a northern town, and belonged to this town only in the sense of having been born here. A third, that of a baby who died within the first six months of its life, and who was not born here, and had never lived here, though its parents had done so some considerable time previously. And a fourth is that of a student at a distant university, who went there from this town two or three years before his death there.

It is evident, upon contemplation, that the intricacies attending the effort to refer all deaths to places to which they nearly or remotely belong are endless, and unless done with the utmost circumspection, any such effort must result in confusion worse confounded. A large part of the population of the country is constantly shifting, and the individuals, although not constant residents, belong to no place more truly than the place where they at the moment reside. There are many who change their residences with the seasons, as regularly as the swallows. If deaths of "visitors," school boarders, and others are to be deducted, it becomes necessary to make equivalent deductions from the census population, which must be carefully examined for the discovery of all "foreigners," these being referred to the populations of the districts to which they belong. We might then have to adopt a limit of residence, say of two years, as a qualification of

citizenship, or determine upon some other equitable means of settling whether a person belonged to the particular population, or not.

However, as such a correction of the population might prove impracticable, perhaps it would be better to come to an understanding all round to some such effect as this: that the only deaths permitted to be deducted from the death returns, and referred to other districts are those that have occurred in institutions, which serve an area larger than the district actually containing them, and are of persons who have come immediately from the outside districts into the institutions.

Yours faithfully,
J. H. GARRETT.

Cheltenham, May 12th, 1908.

THE SACRAMENT.

MEDICAL OFFICER'S APPEAL FOR INDIVIDUAL CUPS.

The following circular letter has been addressed to the various places of Divine Worship in Swansea:—

County Borough of Swansea,
Health Department,
10, Somerset Place,
April 30th, 1908.

1st May, 1908.

To the Governing Body of ———.

Gentlemen,—I wish to bring to your immediate notice a matter which vitally concerns the public health of the residents of the County Borough of Swansea.

In the celebration of the Holy Communion, it is customary in this town to pour the wine into a limited number of silver cups (usually four), and these are passed from one person to another, as many as 50 or 100 persons drinking out of one and the same cup. This is greatly to be deplored, as it is a most fruitful method of conveying the germs of disease (notably pulmonary consumption or phthisis) from unhealthy to healthy people. In this way diseases of the nose, mouth, throat, and lungs are readily communicated. I cannot too strongly condemn this practice, and would respectfully ask you to seriously consider the question of providing separate drinking vessels for each communicant. This is now done in many parts of the country, and in Swansea is, I understand, in vogue at Argyle Chapel. The vessels are made either of glass or metal, and should be thoroughly cleansed with boiling water after use. They are made in small sizes, arranged in circular manner on a tray with raised platforms. It is well known that many persons will not partake of the wine owing to a fear of contracting disease, and there is no reason why we should sanction in public places methods which would not be tolerated for a single moment in our own houses.

I shall be much obliged if you will be good enough to let me know, as soon as possible, what decision you have come to in the matter.—I am, Gentlemen, your obedient Servant,

DAVID J. MORGAN,
Medical Officer of Health.

PROCEEDINGS OF THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

North-Western Branch.—A meeting of the above Branch was held at the Chemical Club, Victoria Hotel, Manchester, on Friday, May 15th, 1908. *Present:* Dr. A. E. Brindley (in the chair), Drs. Wilkinson, Hamilton, Young, Arnold, Buckley, Hibbert, Daley, Hitchon, Welsh, Merry Smith, Edlin, Fraser, Paddock, Harris, Sergeant, Wheelton, Dearden, Barlow and Mr. Bishop.

Apologies for absence were received from Drs. Greenwood, Coutts, Garstang and Berry. Minutes of last meeting were read, confirmed and adopted.

Doctors HUTCHINSON and CARNWATH were elected Members of the Branch.

MR. BISHOP introduced to the notice of the members a new self-developing formaldehyde disinfectant, and the thanks of the meeting were accorded to him for his trouble.

DR. BARLOW then proposed the following resolution: "That in the opinion of this Branch much money is wasted in the purchase of many disinfectants which are of no practical use; that many of the uses to which disinfectants, good and bad, are put, are unscientific and ineffectual; that the public needs education on right lines on the subject of disinfection; that there is need for independent scientific enquiry into the whole process of disinfection, its limitations and its methods of application."

The Resolution was seconded by DR. COOTE HIBBERT.

After considerable discussion, an Amendment was proposed by DR. WILKINSON, seconded by DR. ARNOLD, that the words, "that many of the uses," etc., to "on the subject of disinfection" be deleted.

The Amendment was carried, and was afterwards adopted as the substantive Motion, the Resolution in its final form reading: "That in the opinion of this Branch much money is wasted in the purchase of disinfectants which are of no practical use, and that there is need for independent scientific enquiry into the whole process of disinfection, its limitations and its methods of application."

The Honorary Secretary explained to the meeting that it has been customary for the particular Branches to present to the Society, portraits of the Presidents who have been members of those Branches. Dr. Vacher, a member of the North-Western Branch, was, many years ago, a President of the Society, and his portrait was not to be found amongst those of the other Presidents.

It was resolved on the proposition of DR. WHEATLEY, seconded by DR. WILKINSON, that Dr. Vacher's portrait be presented to the Society, and that the cost be borne by a private subscription among the members of the Branch, and that the subscription be limited to 2s. 6d. The Honorary Secretary undertook to arrange all the preliminaries.

In the absence of Dr. Berry, the Secretary read his paper entitled, "What are we doing to improve our Milk Supply?" In the discussion which followed, Drs. Sergeant, Barlow, Wilkinson and Brindley took part, and a cordial vote of thanks was passed to Dr. Berry for his interesting paper.

Yorkshire Branch.—A meeting of this branch was held at the Education Offices, Leeds, on Friday, March 27th, 1908.

Dr. Burman, the president, was in the chair, and the other members present were Drs. Cameron (Leeds), Castle (Darfield), Evans (Bradford), Forsyth (Birstall), Gibson (Wakefield), Halliwell (Dewsbury), Lambert (Farsley), Martin (Brighouse), Milne (Mirfield), Moore (Huddersfield), Muschamp (Yeadon), Robinson (Wakefield), Sadler (Barnsley), Scatterty (Keighley), Stansfield (Clayton), Sutherland (Cleckheaton), and J. R. Kaye, hon. sec. (Wakefield).

A new member was elected—Dr. R. V. Clark, Assistant Medical Officer of Health, Leeds.

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, Quarterly Returns, and Annual Summary. Cardiff, 1907, by Dr. Edward Walford. Factories and Workshops, 1906 (Supplement to the Annual Report of the Chief Inspector). Hereford, 1907, by Dr. H. Cecil Moore. Gateshead C.B., 1907, by Dr. F. Morrison Clayton. City of Birmingham, first quarter, 1908, by Dr. John Robertson. County of Forfar, 1907, by Dr. Thos. F. Dewar. County of Banff, 1907, by Dr. Alex. Ledingham. Minutes of the Metropolitan Asylums Board. Salford C.B., first quarter, 1908, by Dr. C. H. Tattersall. City of Aberdeen, February and March, 1908, by Dr. Matthew Hay. City of Providence, 1907, by Dr. Chas. V. Chapin. City of Westminster, 1907, and March, 1908, by Dr. Francis J. Allan. Bridgend U.D., 1907, by Dr. Wyndham Randall. Penybont R.D., 1907, by Dr. Wyndham Randall. Borough of Eccles, 1907, by Dr. W. M. Hamilton. Leyton U.D., 1907, by Dr. J. Francis Taylor. Royal Borough of Kensington, March 22—April 18, 1908, by Dr. T. Orme Dudfield. Board of Health of the State of New Jersey, 1907. Burgh of Arbroath, 1907, by J. Keith Anderson. City and Port of Gloucester, 1907, by Dr. W. M. Hope. Midwives Act Committee, Preston, by Dr. Edward Sergeant. Lancashire C.C. Public Health Committee, Preston, by Dr. Edward Sergeant. City of Edinburgh, 1907, by Sir Henry D. Littlejohn. Festiniog U.D., 1907, by Dr. Richard Jones. Kimberley, 1907, by Dr. A. W. Reid. Port of Manchester, 1907, by Dr. W. F. Dearden. South Shields C.B., 1907, by Dr. Sydney G. Mostyn. Ipswich C.B., by Dr. A. M. N. Pringle. Surrey C.C., by Dr. Edward C. Seaton. County of Roxburgh, 1907, by Dr. M. J. Oliver. Wigan C.B., 1907, by Dr. Wm. Berry. Germiston Municipality, 1906-7, by Dr. B. G. Brock. Borough of Walsall,

1907, by Dr. J. Wilson. Goole U.D., 1907, by Dr. Alex. M. Erskine. Stockport, C.B., 1907, by Dr. Meredith Young. City of Leeds, 1906 (and part of 1907) by Dr. J. Spottiswoode Cameron.

Journals.

British Medical Journal. Lancet. Hospital. Experiment Station Record. Glasgow Medical Journal. Municipal Journal. Sanitary Record. Australasian Medical Gazette. Proceedings of the Royal Society of Medicine. Journal d'Hygiène. Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege. Medical Review of Reviews. The American Medical Journal of the Medical Sciences. Tropical Medicine and Hygiene. Birmingham Medical Review. Giornale della Reale Società Italiana d'Igiene. New Zealand Medical Journal. Bulletin du Service de Santé et de l'hygiène. Royal Sanitary Institute. Bulletin of the State Board of Health of Massachusetts. Royal Army Medical Corps. Medical Temperance Review. Official Circular of the County Council's Association. All-India Hospital Assistants' Journal. Transvaal Medical Journal. Journal of the Royal Institute of Public Health.

Pamphlets.

Sanitation in Providence, by Dr. Chas. V. Chapin. Contact Infection, by Dr. Chas. V. Chapin. On a Case of Acute Poliomyelitis, Associated with a Diplococcal Infection of the Spinal Sac, by Drs. Wm. Pasteur, Alex. G. R. Foulerton, and H. MacCormac.

Lessons on the Laws of Health.

Education Dept. Western Australia. Fred. Wm. Simpson, Perth, Western Australia.

The Curriculum of the Primary Schools.

Education Dept. Western Australia. Fred. Wm. Simpson, Perth, Western Australia.

Elementary Meteorology.

By Robert H. Scott, M.A., F.R.S. Presented to the Library by W. W.

The Health of the School Child.

By Dr. W. Leslie Mackenzie. Methuen and Co., London, at 2s. 6d.

Infancy and Infant Rearing.

An Introductory Manual. By Dr. John B. Hellier. 2nd Edition Revised. Chas. Griffin and Co., London, 3s. 6d.

Elements of Water Bacteriology.

With special reference to Sanitary Water Analysis. By S. C. Prescott and C. E. Amory Winslow. Published by Chapman and Hall, Ltd., London, 6s. 6d. net.

Clean Water and How to Get It.

By Allen Hazen. Chapman and Hall, Ltd., London.

Public Health Laboratory Work.

By Dr. Henry R. Kenwood. H. K. Lewis, 136, Gower Street, W.C., 10s. net.

The Bacteriology of Diphtheria.

By Drs. G. H. F. Nuttall, and C. S. Graham Smith. Cambridge University Press, 25s. net.

Hay Fever, Hay Asthma:

Its Causes, Diagnosis, and Treatment. By Dr. Wm. Lloyd. 2nd Edition. Henry J. Glaisner, London, 4s. 6d. net.

RECENT PUBLIC HEALTH LITERATURE.

Diarrhoea.

GRAHAM (T. O.). Epidemic diarrhoea and its influence on infantile mortality. *Dublin Jour. Med. Sci.* 1908, cxxv, 331.—KNOX (J. H. M.). The relation of the bacilli belonging to the so-called dysentery group to the diarrhoeal affections of infants. *Arch. of Pediatrics*, 1908, xxv, 241.

Disinfectants.

RIDEAL (S.). On testing disinfectants. *Jour. Trop. Med.*, 1908, xi, 133.

Dropsy, Epidemic.

MUNRO (D.). Epidemic dropsy in the Darjeeling District. *Indian Med. Gaz.*, 1908, xliii, 124.—PEARSE (F.). On the probable identity of Beri-Beri and epidemic dropsy. *Indian Med. Gaz.*, 1908, xliii, 128.

Food.

DURHAM (H. E.). The chemical standardization of foods and drinks, with special reference to cider and perry. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 287.—WILEY (H. W.). Influence of food preservatives and artificial colours on digestion and health. Sulphurous acid and Sulphites. *Pacific Med. and Surg. Jour.*, 1908, li, 225.

Hæmoglobinuric Fever.

DEADERICK (W. H.). Etiology of Hæmoglobinuric fever. *Internat. Clinics*, 1908, 18th Ser., i, 174.

Hospital Ships.

PICKTHORN (E. B.). Hospital ships. *Jour. Roy. Army Med. Corps*, 1908, x, 409.

Hygiene, Public.

WALFORD (E.). Sanitary progress in Cardiff. *Jour. Roy. Sanit. Inst.*, 1908, xxix, Supp. p. 93.

Immunity.

DUCKWORTH (Sir D.). Textural proclivities and immunity the personal factor in medicine. *Internat. Clinics*, 1908, 18th Ser., i, p. 72.

Indicanuria.

ABRAMS (A.). Autointoxication and indicanuria. *Med. Record, N.Y.*, 1908, lxxiii, 689.

Infant Feeding.

LADD (M.). The need of greater accuracy in prescribing starch in infant feeding. *Arch. of Pediatrics*, 1908, xxv, 256.

Inoculation.

PRICHARD (H.). On specific inoculation. *West Lond. Med. Jour.*, 1908, xiii, 97.

Insane, Care of

COHN (E.). The systematic occupation and entertainment of the insane in Public Institutions. *Jour. Amer. Med. Assoc.*, 1908, l, 1249.

Leprosy.

ASHMEAD (A. S.). Some considerations on the question of leprosy; transmission by insects and fish. *Pacific Med. and Surg. Jour.*, 1908, li, 230.—HUNTER (T.). Leprosy: Some notes on its causation, symptoms and treatment, based on an experience of 152 lepers in the Leper Jail of the United Provinces, India. *Lancet*, 1908, i, 1333.

Malaria.

WOLDERT (A.). How the malarial parasite perpetuates its existence. *Jour. Amer. Med. Assoc.*, 1908, l, 1247.

Mediterranean Fever.

BASSETT-SMITH (P. W.). The cause, prevention and treatment of Mediterranean fever. *Veterinary Jour.*, 1908, lxxiv, 174.

Milk.

MOHLER (J. R.). Diseases and conditions of cattle that may affect the quality of milk. *Veterinary Jour.*, 1908, lxxiv, 166.—SUMMONS (W. H.). The replacing of milk in the dietary of babies after attacks of enterocolitis. *Intercol. Med. Jour. of Australas.*, 1908, xiii, 142.

Mortality, Infantile.

PILKINGTON (H. O.). Infantile mortality: Its causes and remedies. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 296.—WOOD (A. J.). Preservation of infant life. *Intercol. Med. Jour. of Australas.*, 1908, xiii, 128.

Nutrition.

RUBNER (MAX). Theorie der Ernährung nach Vollendung des Wachstums. Ernährungsorgänge beim Wachstum des Kindes. Das Wachstumsproblem und die Lebensdauer des Menschen und einiger Säugetiere vom energetischen standpunkte aus betrachtet. *Arch. fur Hygiene*, 1908, lxxvi, 1-208.

Opsonins.

FORDYCE (A. D.). Some records of the value of the opsonic test for diagnosis, and of the employment of vaccines in certain infective conditions in children. *Internat. Clinics*, 1908, 18th Ser., i, p. 40.

Overcrowding.

STELLA (A.). The effects of Urban congestion on Italian women and children. *Med. Record, N.Y.*, 1908, lxxiii, 722.

Parasites, Animal.

HEANLEY (C. M.). A large fluke of man probably not hitherto described. Fasciolopsis Buski as a parasite of man in Hong Kong, its usual host probably the pig. Illustrations. *Jour. Trop. Med.* 1908, x, 122.

Physical Culture.

AMY (Lieut.-Col. A. C.). The medical officer, the recruit, and the gymnasium. *Jour. Roy. Army Med. Corps*, 1908, x, 474.

Poliomyelitis epidemic.

HOLT (L. E.) and BARTLETT (F. N.). The epidemiology of acute poliomyelitis. A study of thirty-five epidemics. *Amer. Jour. Med. Sci.*, 1908, cxxxv, 647.

Rheumatism.

BEATTIE (J. M.). Acute rheumatism: The evidence in support of its bacterial origin. *Edin. Med. Jour.*, 1908, n.s., xxiii, 391.

Rivers Pollution.

SCOBLE (H. T.). Rivers pollution. With special reference to the Board proposed by the Royal Commission. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 202.

Schools.

READE (M. T.). School design in relation to health. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 281.

Sewers.

COUTTS (F. J. H.) and BRODIE (J. S.). Sewer Ventilation and the intercepting trap. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 181.

Syphilis.

HILLER (K.). A method of rapidly staining spirochaeta Pallida. *Intercol. Med. Jour. of Australas.*, 1908, xiii, 148.

Tuberculin.

CAMPBELL (R. P.), H. McKEE and P. G. WHITE. The opthmo-tuberculin reaction. *Montreal Med. Jour.*, 1908, xxxvii, 276.

Public Health

THE JOURNAL OF THE

Incorporated Society of Medical Officers of Health.

No. 5.

JULY, 1908.

VOL. XXI.

THE POSITION OF THE SCHOOL DOCTOR IN THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

NOTHING in recent public health progress is more gratifying than the rapid development of school hygiene in this country during the last few months. This development is the result of several causes, the most important being the memorandum on the medical inspection of school children issued by the Board of Education last November.

In this eminently statesmanlike document, the influence of which steadily increases as time goes on, the main lines of progress were laid down in a thoroughly practical way, and with a full understanding of the exigencies of the situation. For the promotion of the public health through the school, education authorities were advised to "use to the utmost extent the existing machinery of medical and sanitary administration, developing and supplementing it as required, rather than supplanting it," and this advice has been generally followed throughout the country. The numerous medical appointments that have lately been made by local authorities to administer the Education (Administrative Provisions) Act, 1907, have had the effect not of creating a new type of medical official, but of enlarging the personnel of the existing public health service.

It is hardly necessary to say that these recent developments are matters of great moment to the Society of Medical Officers of Health, but at this stage it may be well to recall that the Society has made special efforts to promote the progress of school hygiene, and to safeguard the interests of those engaged in that important branch of public health work. Some time ago a special committee was appointed by the Society to "watch the progress of educa-

tional legislation, and to consider and report on any urgent business in connection therewith," and PUBLIC HEALTH has been considerably enlarged to provide for the insertion of additional matter relating to school hygiene. And now the Society has taken another important step. At the Extraordinary General Meeting held on June 19th, 1908, to revise the Articles of Association, it was unanimously decided that the full privileges of the Fellowship of the Society should be open to "Medical Officers appointed by Education Authorities." By this decision school doctors, whether technically medical officers of health or not, become eligible to hold office in the Society and to take part in its government.

The Society, in taking the first opportunity thus to extend the basis of its membership, is but acting in accordance with the view that it has consistently upheld, namely, that school hygiene is not a distinct speciality, but is an integral part of our system of public health administration. This is the view expressed by the Board of Education in their memorandum on the medical inspection of school children, and it is a view which the events of the last few months justify us in saying has been generally adopted in the country. The Society of Medical Officers of Health has affirmed its adherence to this view in a highly practical way, and it is to be hoped that our colleagues who have recently been appointed to carry out the Education (Administrative Provisions) Act will avail themselves of the opportunity that now offers to take part in the work of a society that has done so much for the progress of public health. At the present time it is of the utmost importance that all who are engaged in the practical work of preventive medicine should realise their community of aim and interest, and should work together in close association for the common good.

PRESERVATIVES IN MILK AND CREAM.

IN the case of *Cullen v. McNair*, which is reported in our present issue, the Divisional Court have given a decision which will, we hope, remove some of the difficulties that stand in the way of the local authorities that are striving to protect the food supply.

The appellant in this case is a grocer, who was convicted at the Westminster Police Court, on August 2nd, 1907, for selling cream mixed with 0.313 per cent. of boracic acid "so as to render the article injurious to health, contrary to Section 3 of the Sale of Food and Drugs Act." An appeal against this conviction was heard at Quarter Sessions on October 31st, November 8th, and 18th, and expert evidence was called on both sides. The Court of Quarter Sessions confirmed the conviction of the magistrate, finding that although cream mixed with boracic acid equivalent to that found in this case is not injurious to grown men and women, it is injurious to the health of children and invalids, who form a class of whom this food is used and to whom this section applies. For the appellant it was contended that an article of food which was uninjurious except to children and invalids was not "injurious to health" within the meaning of Section 3 of the Act, and on this point the Court of Quarter Sessions stated a case for the High Court.

The case was heard on June 1st, and, as will be seen from the report, the appeal was dismissed with costs. The Lord Chief Justice, in giving judgment, used the following words:

It must not be thought that I think they [the magistrates] ought to find a thing injurious to health because some exceptional individual is liable to have some particular injury done to his health, such as lead poisoning or anything of that sort, by eating some particular article of food. It is a case in which upon the case stated, the cream, if given to children or invalids, is injurious to health. It seems to me it is open to the magistrates to say that a person who did that had mixed with an article of food an ingredient so as to render the article injurious to health, with the intent that the same shall be sold in that state.

It is an important matter to have secured a decision on this point, and the Westminster City Council are to be congratulated on the way in which they have fought the case to a definite issue.

This case well illustrates some of the difficulties local authorities have had to contend against in the attempt to control the practice of adding chemical preservatives to food. It

has been left to the more public-spirited authorities to risk the ratepayers' money in costly legal proceedings involving expert evidence on both sides. Sometimes the proceedings, as in the Westminster case, are successful, but in many cases the result has been otherwise, and the local authority has had to bear the expense and discredit that attend unsuccessful prosecutions. It is not sufficiently realised that our present position in regard to food preservatives has only been attained by a large expenditure of public money that would have been saved had effect been given to the recommendations of the Departmental Committee on Food Preservatives, whose report was issued as long ago as 1901.

In dealing with this difficult and highly important question, local authorities have not been left without guidance from Government Departments. Some two years ago the Local Government Board issued a circular letter, in which the attention of local authorities was requested to the subject of the addition of preservatives to milk. Unfortunately, however, this circular contained expressions which the dairy trade interpreted to mean that the Board were of opinion that milk containing boracic acid to an amount not exceeding forty grains per gallon could not be regarded as injurious to health. This supposititious opinion of the Board has been made the most of in the courts during the past two years, as medical officers of health know to their cost. It appeared prominently in the Westminster case. Mr. Bousfield, K.C., on behalf of the appellant stated that "the Local Government Board had laid down the rule as to milk that boracic acid not exceeding forty grains per gallon was not injurious to health." (*Times* report). It is true that the Board's circular, when carefully studied, does not bear this interpretation, but it is not easy to see what would have been lost had this important official statement been expressed in terms that admitted of no such mistake.

The present time, however, is one for thankfulness. Medical officers of health all over the country are much indebted to the Westminster City Council for clearing up an important point in the protection of the food supply, and we may hope that the whole question of preservatives in milk and cream will be dealt with in a comprehensive way in the long-promised Milk Bill, which, unfortunately, has not yet been introduced into Parliament.

MEAT POISONING AND THE MEAT-POISONING BACILLI.*

By GEORGE F. BUCHAN, M.B., Ch.B. (Glas.),
D.P.H. (Camb.).

Assistant Medical Officer of Health, City of Birmingham.

ALTHOUGH doubtless many outbreaks of meat poisoning have occurred in the centuries that are past, it is only forty-one years ago now since the first outbreak was put on record. This outbreak occurred at Fluntern in Switzerland, and twenty-seven persons are reported as having been seized with the symptoms of meat poisoning after eating veal. The calf from which this veal had been derived was very young—only five days old—and its joints contained what is described as "yellow water." Probably it was suffering from some form of septicæmia. Since that time our knowledge has made rapid progress, and probably Bollinger was the man who gave the earliest attention to the subject. It was he, at least, who, in an address delivered in 1876 before the German Society for Public Hygiene at Düsseldorf, first called the attention of the medical world to the great importance of septicæmia and pyæmia in our food animals as a cause of meat poisoning. He states that, from the point of view of human health, these diseases are relatively of greater consequence than anthrax and glanders, since, in the first place, they occur more frequently, and in the second, their toxins are more resistant. This latter statement is remarkable in the light of later evidence, as Fischer has stated that the toxins of the *Bacillus enteritidis* of Gärtner, now proved to have been the cause of numerous outbreaks, will resist a temperature of 100° C. for one and a half hours; and Cathcart has supported this to some extent by experiments carried out less than two years ago, in which he demonstrated the virulence of these toxins after exposure to 100° C. for thirty minutes. In 1880, Bollinger again refers to the subject of meat poisoning, reasserts his views stated four years earlier, and affirms that careful observations in eleven extensive outbreaks of meat poisoning, with 1,600 cases, have amply justified his earlier conclusions. In this latter address he makes a critical survey of the literature on the subject up to 1880. This is extended by

* A Paper read before the Midland Branch of the Incorporated Society of Medical Officers of Health on March 19th, 1908.

Ostertag, in his handbook on meat inspection, up to the year 1903. During these thirteen years there are to be found records of ninety outbreaks, in which 4,000 cases occurred, which are attributed to the ingestion of meat from unhealthy animals. Septicæmia or enteritis in one form or another is named as the disease from which these animals suffered.

Of all these outbreaks the most important from the etiological point of view is that which occurred in Frankenhäusen in May, 1888, and which was investigated bacteriologically by Gärtner. From a fatal case and from the incriminated meat he succeeded in isolating the bacillus which now goes by his name as the *Bacillus enteritidis* of Gärtner. Although the cow from which the meat was derived had suffered from persistent diarrhoea some time before death, the meat appeared perfectly good, and the spleen, liver, and other organs appeared normal, and all that could be detected was a slight reddening of the intestinal mucosa. Next perhaps in order of etiological importance was the outbreak in which the etiology of sausage poisoning, botulism or allantiasis engaged the attention of Van Ermengem. Until this time the symptoms of sausage poisoning were held by the scientific world to have been caused by the various products of the decomposition or putrefaction of proteids. But on the occasion of an outbreak of this disease at Elezelles in December, 1895, Van Ermengem, after prolonged investigation, isolated the *Bacillus botulinus* from portions of a ham which had caused the deaths of three persons, and symptoms of sausage poisoning, more or less severe, in seven others; and to this bacillus he attributed all the symptoms.

Since those dates bacilli belonging to those two classes have continued to hold the field as the etiological factors in cases of food poisoning. The *Bacillus botulinus* is in a class by itself, but many members—about thirty—of the enteritidis group have been described.

The pioneers in bacteriology, and especially those who worked on the nature of the substances secreted by bacteria, very early discovered the existence of what they called the ptomaines. These bodies have many of the chemical and physical properties of the vegetable alkaloids. Long before this discovery, observers had noted that the symptoms manifested by sufferers in many outbreaks of food poisoning were similar to those produced by certain vegetable alkaloids. It is not surprising,

therefore, that on this evidence the conclusion was arrived at that food poisoning was the result of the ingestion of these ptomaines, and that food poisoning and ptomaine poisoning were synonymous terms. Strictly speaking, the term ptomaine poisoning is not of such general application, and should be used only in those cases where the symptoms are the result of the ingestion of ptomaines preformed in the food. It is, however, a very grave question if ever a case of food poisoning occurred under those conditions. The quantity of ptomaines which can be demonstrated in decomposing food stuffs is always extremely small. The liquid containing the ptomaines, in food under examination, is always more deadly in its effects than the isolated ptomaines; and very many ptomaines have been isolated which are practically without effect on the human system. Brieger it was who first discovered the ptomaines more than twenty years ago now. Since then bacteriologists have not been idle, and they have demonstrated that there are bacterial products which are much more potent than the ptomaines, or, for that matter of it, than any known alkaloid. I refer to the toxins. These bodies have not all the same empirical formula, nor are they all of the same nature. They differ widely. Some belong to the class of ferments. Others resemble albumoses and proteoses—bodies of complex molecular constitution, formed at an early stage in the digestion of proteid. Toxins may be divided into two classes with reference to their seat of formation:—

1. "Intra-cellular toxins," contained within the bodies of the organism; and
2. "Extra-cellular toxins," produced in the culture medium.

Some bacilli may develop both kinds of toxins which may be recognised by their different properties. In considering, then, the etiology of food poisoning, we must bear in mind that these toxins may play a part. We may describe as "intoxications" those cases which result from the ingestion of food containing these toxins, and these toxins alone. But this condition would only hold where the bacteria had died out, their extra-cellular toxins, if any, remaining in the food, and their intra-cellular toxins, if any, remaining in the dead bodies of the bacteria. It will take many, many days, and often many, many weeks, for bacteria to die out in a medium in which they grow and multiply; and long

before this has occurred, the food, you will agree, would not be in such a condition as to tempt even the most hungry. On the other hand, in all recorded cases of food poisoning the food has not been in an obviously bad condition; and the point which I desire to make is that living bacilli gain admission to the body in cases of food poisoning just as much as in cases of typhoid fever and diphtheria.

The chief point in the diagnosis between poisoning by toxins and infection by bacteria is cited time and again as the length of the incubation period, a short incubation period pointing to the former, and a long to the latter. But surely it is not necessary to pre-suppose a chemical agent when we have a rapid onset of symptoms. If it is, the whole etiology of disease will require to be remodelled. In my view, it is the dose and virulence of the organism and the susceptibility of the patient which determine the length of the incubation period, as well as the severity of the attack. Of course, no one is in a position to deny absolutely that the ingestion of toxins, and toxins alone, may produce the symptoms of food poisoning, but up to the present time we have no information that such cases occur. On the other hand, we can clearly state that in all cases where a complete bacteriological examination has been made, bacteria, as the causal agents, have been isolated from the organs of fatal cases, thus proving that an actual infection by living organisms had occurred.

What, then, are the various microbes concerned with these outbreaks? I have already indicated that the vast majority belong to the enteritidis group, and the other is the *Bacillus botulinus*, an obligatory anaerobe isolated from a sample of ham by Van Ermengem in 1895, by Romer also from ham, while Kempner isolated it from the intestine of the pig. By far the more important is the enteritidis group, and to it I propose to give the greater share of attention this afternoon. It contains a group of organisms of the very greatest interest and importance, which may be considered as intermediate in their characters between the coli group on the one hand and the typhoid group on the other. But, after all, the members of these groups are readily distinguishable. The bacilli of the enteritidis group are actively motile, non-sporing organisms which do not retain the stain by Gram's method. Their growths on agar and gelatine slopes are creamy and trans-

lucent, and the latter medium shows no liquefaction. Their fermentation tests are important, and to some extent diagnostic. They do not ferment lactose—and this at once distinguishes them from the coli group—or saccharose. They all ferment glucose, mannite, laevulose and dulcitol. But their most characteristic reaction (with one exception—*Bacillus paratyphoid A*) is that with litmus-milk, in which they produce transient acidity, followed by distinct and definite alkalinity. This is a very curious reaction, and chemically it is difficult to understand. It can only be attributed to the ultimate formation of amines, which must be formed from the nitrogenous compounds of milk in relatively greater quantities than the lactic acid from the lactose, which accounts for the first part of this phenomenon. The time taken for this reaction varies with the organism. The exception, *Bacillus paratyphoid A*, produces permanent acidity. Indol, when it is produced at all, is very slight, hardly recognisable.

The group may be divided into three sub-groups:—

1. The Gärtner sub-group, including the *Bacillus enteritidis* of Gärtner.
2. The Aettrycke sub-group, including the bacillus of hog cholera, which Theobald Smith does not recognise as essentially different from the *Bacillus enteritidis* of Gärtner.
3. The Paratyphoid sub-group, including the *Bacillus paratyphosus A* and *Bacillus paratyphosus B*. These are the organisms which are of etiological importance in cases of paratyphoid fever. Most of the recorded cases have been attributed to the *Bacillus paratyphoid B*.

In addition to these there is the *B. psittacosis*, which was found in a disease of parrots, and was held to be responsible for an outbreak which occurred in France, and in which the symptoms were similar to those of food poisoning.

In order to distinguish these sub-groups it is necessary to resort to agglutination tests, their cultural reactions being practically alike; and for the satisfactory and complete identification of any of these organisms it is necessary to test them against sera prepared with known cultures, the limits of agglutination of these sera being known. For example, in the

particular outbreak of food poisoning due to eating brawn in which I was concerned, and which I reported fully in the *Lancet* of December 7th last, I isolated a bacillus with all the cultured characteristics of the *Bacillus enteritidis* of Gärtner. Still, it might have belonged to the hog cholera sub-group or the paratyphoid sub-group, whose cultural reactions are practically identical with those of the *Bacillus enteritidis* of Gärtner, and that it belonged to the Gärtner sub-group could not be averred until I had tested its agglutination with sera prepared with known cultures. Accordingly I obtained Gärtner serum, paratyphoid B serum and paratyphoid A (Brion and Kayser) serum of known limits of agglutination with their homologous organisms, and tested the reactions of the bacillus I had isolated against these. I found that, while it was rapidly agglutinated by Gärtner serum in relatively high dilution, it was not agglutinated at all by paratyphoid B or A serum. It is also necessary here to observe that the identity of an unknown organism is not established simply because it reacts at some arbitrary dilution with a known serum, but it is the relative ultimate limits of agglutination of the unknown and known organism with homologous and heterologous sera which are of value. This leads to an important observation on serum diagnosis, which is of much interest to us as medical officers of health. Where Widal's reactions are done in large numbers in a laboratory, some arbitrary dilution is fixed on as a standard—1 in 50 in sixty minutes is a good average standard. This, with or without the clinical symptoms, is often accepted as complete proof of the existence of typhoid fever. But Boycott, in a remarkable paper which appeared in the *Journal of Hygiene* for 1906, clearly showed that sera may contain, besides the homologous or primary agglutinin, heterologous or secondary agglutinins, and that a number of cases diagnosed by such arbitrary standards as I have indicated are not typhoid fever at all, but paratyphoid fever, in the majority of instances caused by the *Bacillus paratyphoid B*, which I have already mentioned as belonging to Sub-group 3 in the classification I have given. The occurrence of such cases in Germany and America is estimated at 10 per cent. of those clinically called typhoid. Boycott gives the figures for England 3 per cent., but admits that this is probably too low. So that you see such cases occur in numbers sufficiently large

to show that they are more than mere matters of bacteriological interest; and especially are they important to the patient, as while the case mortality of paratyphoid is something like 1 to 3 per cent. at the most, that of typhoid is about 18 per cent., and it makes everyone happier all round when the prognosis is favourable. I have briefly indicated the groups of meat-poisoning bacilli and their methods of identification. The next point with which we are concerned is the distribution in nature of these various organisms.

For information on this subject we are mainly indebted to Morgan, who has isolated the *Bacillus enteritidis* of Gärtner and paratyphoid A from the faeces and scrapings of the intestines of various animals—viz., the rabbit, the guinea-pig, the sheep, the pig, the bullock, the calf and the horse. He has also shown that of these two organisms the *Bacillus enteritidis* of Gärtner has by far the greater virulence, for while he was unable to isolate it at all from 133 colonies by plating directly, he isolated the *Bacillus paratyphosus* A by plating directly in twenty-six out of 133 colonies; on the other hand, after passage through an animal, he found the *Bacillus enteritidis* of Gärtner twenty-one times, as against ten for the *Bacillus paratyphosus* A. Morgan also found the *Bacillus enteritidis* of Gärtner in the small intestine of a child, while Ford records several cases in which he found the *Bacillus enteritidis* of Gärtner in the large intestine (more especially the caecum) in the human subject.

Savage, working at the same question in 1904-5, specially examined the excreta of two cows, one horse and one pig, and scrapings of the intestines of four cows and eight pigs, and found in four cases, all pigs, members of the Gärtner group, and in one of these they were present in great numbers.

This account of the distribution of the meat poisoning bacilli, is interesting, as it at once opens up the possibility of meat becoming infected after slaughter, or even after cooking. The frequency, too, with which these meat poisoning bacilli have been found in the pig's intestine may also account for the greater number of meat poisoning outbreaks due to pig meat. Outbreaks in which the food became infected after slaughter have been frequently recorded; and the last, I believe, was that recorded by myself, already referred to. In this particular outbreak, due to eating brawn, no illness of any kind occurred amongst

those eating the fresh pork or the sausages sold by the same butcher on the same day from the same animals, and inquiries failed to show that there had been anything amiss with the pigs prior to their being killed. Only those who ate the brawn were ill; and as the slaughterhouse was a private one, and the same persons were engaged in slaughtering the pigs and preparing the brawn, it is not difficult to understand how this latter article of food became infected from the intestines of the slaughtered pigs close by. In these days of "bacilli carriers," and from the work of Morgan and Savage which I have already quoted, it is obvious that food animals may be slaughtered which have not suffered from any septic or enteritic process due to *Bacillus enteritidis* of Gärtner, and yet harbour this bacillus in their intestinal tracts to infect, if due care be not taken, the meat after slaughter, and so spread disease.

In the class of meat poisoning outbreaks—and many have been recorded—where the *Bacillus enteritidis* of Gärtner gains access to the food after, or during, cooking, it is difficult to see what prophylactic measures, so far as meat inspection is concerned, can be adopted. But it is clearly objectionable that meat should be prepared on the same premises where slaughtering of animals is done, and still more objectionable if the same persons are engaged in both pursuits. In spite of the most scrupulous cleanliness, infection of the food may occur, and I do not think such a combination of occupations is in the best interest of the public health. When we come again to the question of meat having been infected with the *Bacillus enteritidis* of Gärtner, prior to the slaughter of the animal, how far does meat inspection take us? The mere naked eye inspection after slaughter does not help us very much, for meat containing the bacillus may look distinctly good. What is important in these cases is the history before death; and if the animal has suffered from any disease—especially septic or enteritic—which has necessitated emergency slaughter, then the greatest suspicion should be at once aroused. Under these circumstances there are several tests we may apply to ascertain the soundness of the meat. By the serum reaction, either after death or during the life of the animal, we can ascertain freedom from infection by the meat poisoning bacilli. Another method is to make a culture from the depths of the meat. If bacterial growth occur

within eight to twelve hours when the cultivation is exposed to a temperature of 25° to 30° C., then the meat should be rejected. According to Van Ermengem, this test is reliable eight days after the slaughter of the animal, and even though the meat already shows signs of putrefaction.

And just a word in regard to some practical points in case of an outbreak. In the first place, there is no evidence that personal contagion plays any part in the spread of an outbreak of meat poisoning. So the question of hospital isolation does not arise. The question of treatment does not greatly concern us as medical officers of health, and I am not aware that any anti-Gärtner serum has ever been prepared or used. But what we are concerned with is the cause. A very brief investigation will soon point to some article of food as the general cause. A sample of the suspected article should be secured, and that with the greatest possible promptitude. By anyone who has conducted a bacteriological examination of such material, which has become stale, the importance of this advice cannot fail to be appreciated. The *Bacillus enteritidis* of Gärtner in any food stuff is rapidly outgrown, if not killed, by the *Bacillus coli communis* and *proteus* and other organisms of intestinal type with which it is almost invariably associated. So every hour, every minute, is of importance in securing the sample and packing it in ice until the bacteriological examination can be begun, and this should not be delayed. Should any one or more of the sufferers succumb, then permission for a bacteriological examination of the various organs should be obtained without delay. Specimens should be collected from the spleen, heart-blood, liver and kidney with all possible sterile precautions and all possible haste. These should be packed in ice, again with sterile precautions, and the examination begun with the least possible delay.

In a paper of this kind it is not possible to give a detailed account of the methods to be used in a complete examination of the incriminated food stuff. But with reference to the bacteriological examination, I may say at once that what experience I have had has shown me that the primary culture medium should be a dulcete broth as recommended by Boycott. The majority of, if not, indeed, all, food poisoning organisms are dulcete fermenters; and by means of primary differential culture in dulcete media, the dulcete fermenters are

found in increased proportion. Next an animal experiment, or plating on Drigalski medium and selecting the blue colonies for further cultural tests, may be resorted to. Finally, agglutination reactions with known sera and the sera of persons affected should be done to complete the identification of the organism and its causal relationship with the outbreak. Besides a bacteriological examination, chemical tests for ptomaines and toxins should be performed, and so would the investigation be made complete.

REFERENCES.

- Bollinger (1876). Address delivered at the Fourth Session of the German Society for Public Hygiene in Düsseldorf.
 Bollinger (1880). Address delivered before the Medical Society of Munich.
 Boycott, A. E. (1906). Observations on the bacteriology of paratyphoid fever, and on the reactions of typhoid and paratyphoid sera. *Journal of Hygiene*, vol. vi, p. 33.
 Brieger (1885-6). Ueber Ptomaine (1885-6), part iii, p. 65.
 Buchan, G. F. (1907). An outbreak of food poisoning due to eating brawn. *Lancet*, vol. ii, 1907, p. 1604.
 Cathcart, E. P. (1906). The toxin of the *Bacillus enteritidis* of Gärtner. *Journal of Hygiene*, vol. vi, p. 112.
 Durham, H. E. (1898). On the serum diagnosis of typhoid fever, with special reference to the bacillus of Gärtner and its allies. *Lancet*, 1898, vol. i, p. 154.
 Durham, H. E. (1898). An address on the present knowledge of outbreaks due to meat poisoning. *British Medical Journal*, 1898, vol. ii, p. 1797.
 Van Ermengem (1897). *Zeitschr. f. Hyg.*, 1897, vol. xxvi, p. 1-21.
 Gärtner (1888). *Breslauer Aerztlich. Zeit.*, 1888, Nos. 21 and 22.
 Fischer (1893). *Deut. Med. Woch.*, 1893, p. 575.
 Ford (1904). Studies from the Rochfeller Institute, vol. ii, 1904.
 Morgan, H. de R. (1905). Micro-organisms of meat poisoning. *British Medical Journal*, 1905, vol. i, p. 1257.
 Ostertag (1904). Handbook of Meat Inspection (Wilcox).
 Savage, W. G. (1906). The Bacterial Examination of Water Supplies, p. 72.
 Smith, Theobald (1893). Bureau of Animal Industry. Bull. No. 6, Washington, 1893.
 Thresh and Porter (1906). Preservatives in Food and Food Examination, pp. 303-327.

SIXTEENTH INTERNATIONAL MEDICAL CONGRESS.—The 16th International Medical Congress will be held at Budapest in 1909—from August 29th to the 4th September—under the Patronage of His Imperial and Apostolic Royal Majesty, Francis Joseph I. Full particulars may be obtained from the General Secretary, Dr. E. Grösz, Budapest.

HISTORY OF DIPHTHERIA IN WEST AUSTRALIA.

By H. CUMPSTON, M.D., D.P.H.,

Medical Officer to Central Board of Health, West Australia.

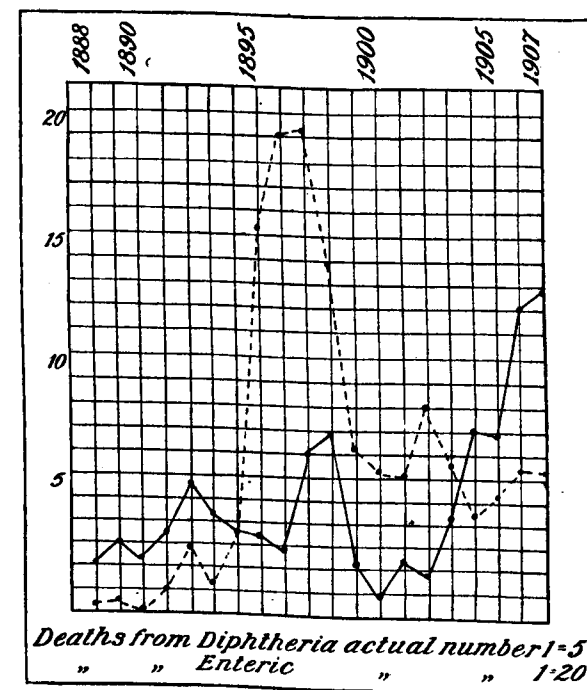
THE data adduced in this paper are of interest for two reasons: they have never been collected before, and, because of the circumstances of the population concerned, they allow of the exclusion of many of the factors which affect the epidemic history of such a disease as diphtheria.

In the first place, there is an exact record of the appearance of the disease in West Australia. The following is an extract from the *Enquirer and Commercial News*, December 14th, 1864: "Lately several persons have been attacked by a disease, insidious in its approach, and occasionally fatal in its results, and which apparently presents some novel features. The patient is first attacked by pain in the throat, accompanied by swelling, loss of appetite, and general debility. Eventually the stomach rejects all food, and the sufferer dies in possession of all his faculties, it would seem from utter exhaustion. Several families in the city have become mourners in consequence of this disease, which has hitherto attacked the young only. The first symptoms being those of an ordinary sore throat, are too apt to be neglected, and by the time medical advice is obtained the patient is too far gone to rally. The early approach of this disease cannot be too closely watched." And two later references, January 13th, 1865: "The throat complaint is becoming very prevalent." June 2nd, 1865: "Another child has died from diphtheria." So that the end of 1864 saw the introduction of diphtheria into West Australia. A careful search into the papers for the preceding year revealed no reference to any outbreak of diphtheria on any of the vessels on their way out from England, so that the origin is rather obscure.

West Australia is distant from Colombo by a ten days' sea journey, and four to five days are necessary for the voyage between Perth, the capital of West Australia, and Adelaide, the nearest large centre of population in Australia. There is no overland communication yet. As the sea journey, then, would

cover the incubation period of almost all the cases, the influence of human migration as a statistical factor becomes negligible. As an epidemiological factor, however, because of the importation of carrier cases, it is not negligible.

From the statistical point of view, then, there is in West Australia a white population of about 250,000 which forms, so to speak, a statistical "pure culture," and in which the influence of various single factors can be studied free from complicating factors to an extent hardly possible in most other countries. There has recently been a large apparent increase of diphtheria in the State, and this has given rise to considerable alarm amongst the residents. Fig. 1 seems fully to substantiate this attitude. It is a curve of the yearly deaths, in actual numbers, from diphtheria during the last twenty years, and it shows a very marked rise beginning in 1903. On the same table is shown the deaths from typhoid fever over the same period; the significance of this will be shown later.

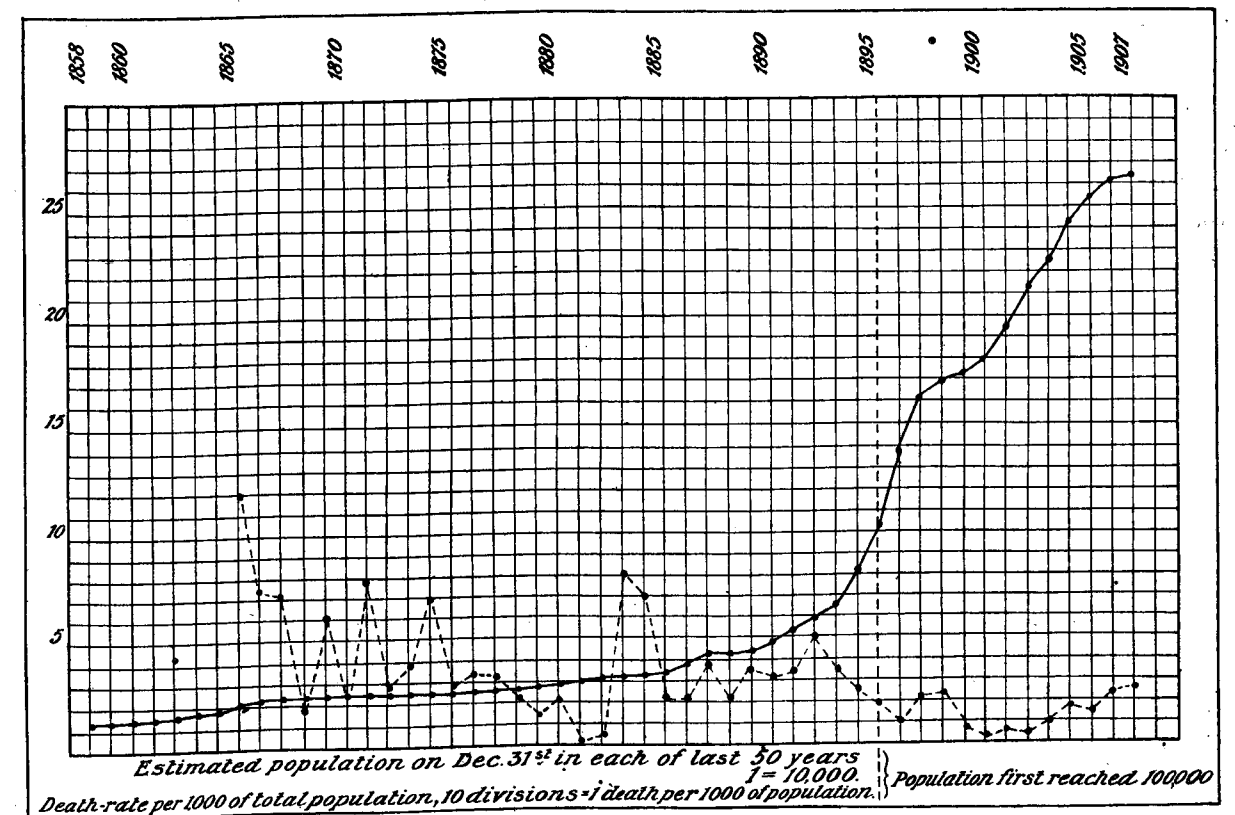


—Diphtheria

FIG. 1.

.....Enteric

To explain the recent rise in the diphtheria curve, it will be necessary to consider the movements of the population as a whole. First let us take the estimated population of West Australia at the end of each year for the last fifty years.



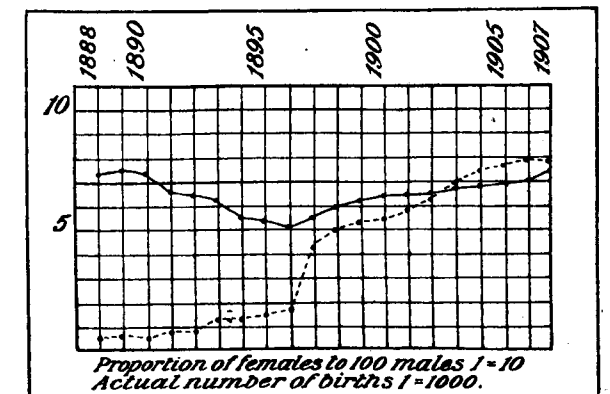
.....Death rate per 1,000

FIG. 2.

It is seen from this diagram that the increase in population was the ordinary natural increase until 1894, when a sudden rise occurred. This sharp rise went on until 1897, when for three years the population again became more or less steady. From 1894 to 1897 the sudden increase was due to the rush of people—chiefly young, strong males, with a small proportion of young females—to the Eastern goldfields. The later rise has been due partly to the discovery of goldfields, and partly to an energetic policy of importing agricultural settlers pursued by the authorities.

It would be surmised that what would happen would be something of this kind: The young men, married and unmarried, would first come alone; and later, after finding the conditions suitable, would send for their wives or marry girls from their native states. This would produce the curves shown in Fig. 3.

This diagram shows the proportion of females to a hundred males, and also the



.....Births.

FIG. 3.

number of births. It is seen here that in 1896 (i.e., two to three years after the sharp rise in total population commences) the proportion of females and the number of births both begin to rise, and continue to rise steadily. From 1893 to 1896 there is a fairly strong fall in the proportion of females to a hundred males.

If, now, the table of age-groups (Table 4)

TABLE 4.—Average for Ten Years of Actual Numbers of Deaths at each Age-period Specified.

	Under 1 year.	1-2	2-3	3-4	4-5	5-10	10-15	15-20	20-25	25-30	30-35	35 and over.
Males	0.7	0.7	0.8	1.5	1.0	6.2	0.4	0.2	—	0.3	0.2	—
Females	1.0	1.3	1.0	1.9	2.3	6.4	1.1	0.3	0.2	—	0.4	1.0

be considered, we see that the greatest mortality from diphtheria is in the 5-10 age-group.

Now, reverting to Fig. 1, we see that the rise in mortality began at the end of 1902, *i.e.*, five years after the commencement of the rise in the number of births. This fact, then, seems to be demonstrated that the rise in mortality which began in 1902, was due to the presence of a large susceptible population in the most suitable age-period.

The typhoid fever mortality curve, also shown in Fig. 1, illustrates the influence of the same factors. The sudden rise in 1894, continuing till 1899, was brought about by the

On Fig. 1. will be seen the curve for the numbers of deaths from diphtheria per 1,000 of total population. This curve shows that prior to 1895 the curve was at its highest point, but with the advent of a large insusceptible population the curve fell, showing in 1897-1898 a slight preliminary rise, but only beginning its regular rise in 1902, just as did the curve for actual numbers of deaths. The preliminary rise in 1897-1898 is also seen on Fig. 1. This is due doubtless to the fact that with the wives who began to arrive in 1897 came also the families who provided a sudden but temporary increase in susceptible population. The curve for the percentage of

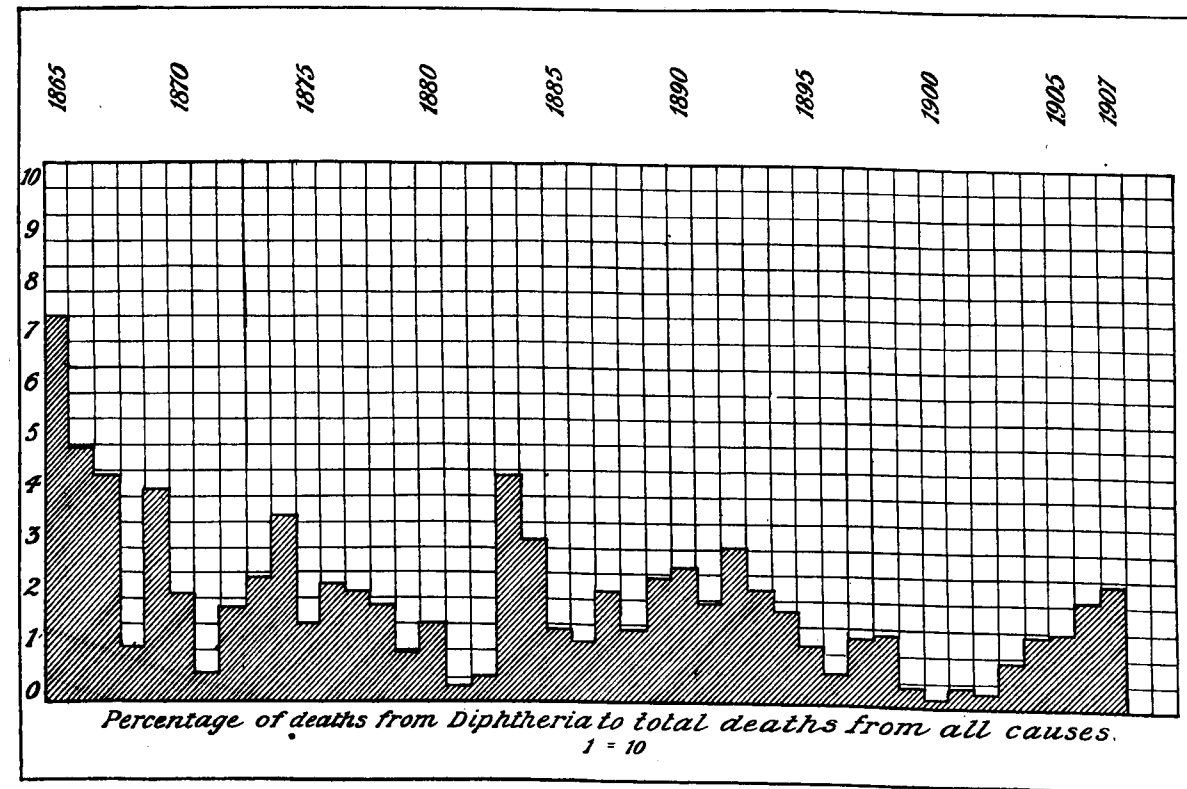


FIG. 5.

aggregation over small areas of large numbers of men at susceptible ages, and it may be predicted that the curve for typhoid fever will show a fresh rise in correspondence with the new young population attaining the age-groups most susceptible to typhoid fever, *i.e.*, will commence about 1912.

In all probability there is at present no other factor appreciably affecting the epidemiology of diphtheria than the single one of the presence of a susceptible population, *i.e.*, as far as this State is concerned.

All that has been considered thus far is the actual numbers of deaths for each year.

deaths from diphtheria to total deaths from all causes shows variations corresponding with those of the curve in Fig. 1. The curve for diphtheria mortality per 1,000 shows no such startling rise as does the actual numbers of deaths curve between 1902-1907; so that there is not here any evidence of a marked epidemic from other causes, but merely the steady spread which might be expected by the operation of the single factor of the appearance of a large new susceptible group of children.

That this spread, however, is alarming enough and that the *B. diphtheriae* is taking

full advantage of its opportunities is seen by the number of notifications since 1902.

TABLE 5.

	No. of cases notified.	Cases per 100,000 of population.	No. of deaths.	Case Mortality.	Death rate per 100,000.
1902	73	35.48	9	12.32	4
1903	81	36.61	22	27.16	9.9
1904	177	74.85	40	22.60	16.9
1905	228	91.52	39	17.14	15.5
1906	317	122.01	65	20.50	17.0
1907	879	333.13	69	7.84	26.1

It should be explained that infectious diseases were first made compulsorily notifiable by the Health Act, 1898, and then they were notifiable to the local boards of health. In 1902 the Central Board was first created and it was ordained that notifications should be sent on to the Central Board each month. This system took a little time to establish fully so that the figures are not quite reliable for the first year. This does not affect the fact that diphtheria is taking a prominent place in the State.

Case Mortality.—In Table 5 it is seen that the mortality varies from 27.16 per cent. to 7.8 per cent., but the possible error in the earlier years has been pointed out. A better basis of observation is a table of cases treated in all the Government hospitals of West Australia with the case mortality per cent. for eleven years, 1896-1906. The average for the eleven years is seen to be 10.67 per cent. This may be supplemented by the Perth hospital report for 1907 with a case mortality of 7.6 per cent. among 249 cases.

TABLE 6.
DIPHTHERIA CASES TREATED IN ALL GOVERNMENT HOSPITALS IN WEST AUSTRALIA.

	Cases treated.	Deaths.	Case mortality per cent.
1896	10	2	20.0
1897	43	6	13.95
1898	124	6	4.83
1899	12	—	—
1900	19	2	10.52
1901	13	1	7.61
1902	15	1	6.66
1903	14	3	21.42
1904	37	6	16.21
1905	181	13	7.18
1906	271	19	7.01
1907*	249	19	7.6

* Perth Public Hospital only.

The case mortality, then, may be taken provisionally as between 7-10 per cent. The errors of observation in a young State like West Australia become larger the earlier the years under consideration. The case mortality at the Metropolitan Asylums Board hospitals for the years 1895-1899 was 17 per cent., and for the whole of London for the same period 17.2 per cent. (Parkes and Kenwood, 2nd ed. page 259.)

Deaths from Diphtheria

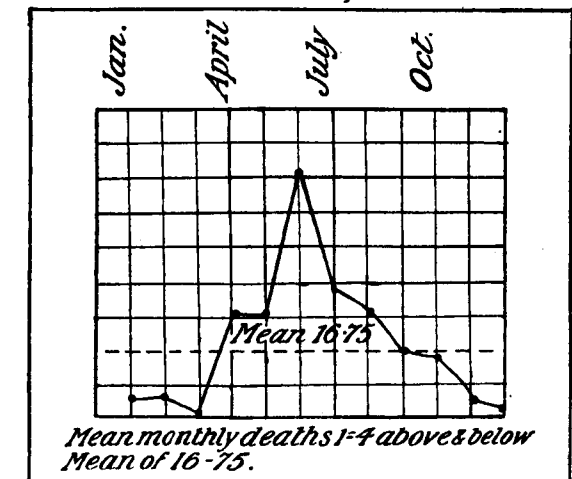


FIG. 6.

Seasonal Prevalence.—From Fig. 6 it is seen that the greatest number of deaths takes place in June, and that the five months including winter—*i.e.* April, May, June, July, August—are the months of greatest prevalence. Fig. 7 of notifications shows that the notifications reach their maximum in May.

Notifications of Diphtheria

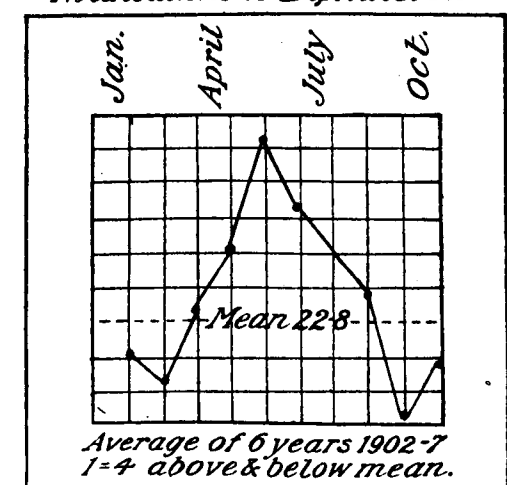


FIG. 7.

Age Distribution.—It is impossible to give the age incidence of the disease, as these figures were only first separately noted this

year. Table 4, however, shows the age distribution of deaths from diphtheria in average numbers for the ten years 1897-1906—i.e. the average at each age period for the whole ten years. The greatest mortality is seen to be from five to ten. More girls than boys die at all ages.

"In England and Wales the mortality for both sexes has since 1891 reached its maximum at the age group ten to fifteen years." (Shirley Murphy, *Lancet*, 8/6/07, "Age incidence of mortality from certain diseases.")

Fig. 8 shows the distributions for the six years 1902-1907, divided according to the Metropolitan area, and the rest of West Australia, and expressed as percentages of the whole. This table shows that the disease is chiefly metropolitan, with a slight tendency to spread to the country districts.

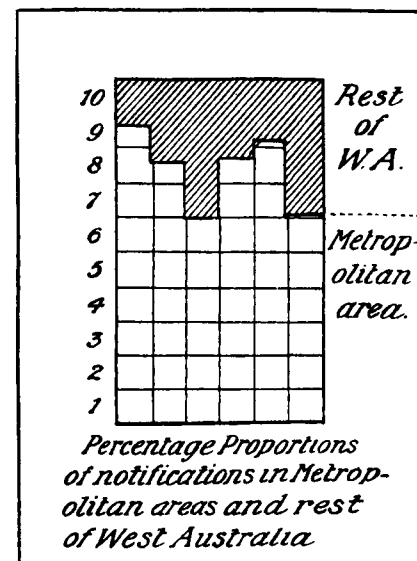


FIG. 8.

School Influence.—This was considered in the notifications for January and February, 1908. The schools opened on January 28th, but the notifications for each day of January and February, arranged in two columns, "school ages" and "outside school ages," showed no increase after January 28th. Education has been compulsory in this State since 1871 to this extent—that thirty-five days' attendance had to be completed in each quarter. In 1899 the standard was extended, and whole-time attendance was made obligatory. It is certain, as has frequently been

shown by the investigation of localised outbreaks, that aggregation in schools plays a large part in the spread of diphtheria, but statistically this factor cannot be put in evidence. In none of the tables did any rise occur after 1899.

In all the above considerations, the term "diphtheria" includes "croup."

Summary.—1. The important factor at work producing an increase in diphtheria is the development of a susceptible population.

2. The case mortality is probably between 7-10 per cent.

3. The seasonal prevalence is most marked.

4. The greatest mortality is in the five to ten age group.

5. It is to be expected that the curve for diphtheria will go on steadily rising for the next few years.

UNWHOLESOME TINNED FRUITS.—At Clerkenwell Police Court, on April 14 and 28, a summons was heard, at the instance of the Islington Borough Council, charging F. B. Costa, Ltd., with having in their possession tins of fruit and vegetables, intended for use as human food, and which were unsound. The foodstuffs were condemned by the magistrate on February 26th. They included tomatoes, apricots, small carrots, peaches, pears, olives, greengages, green peas, black currants, and mixed fruit and vegetables, and the total weight was two tons three cwt. They had been imported from France, Holland, and the United States. The facts were admitted, but the defence was that the articles seized were not intended for human food. It was shown that the bad stuff was mainly found in one part of the premises. For the defence it was stated that the articles seized were returns from retail houses. There were always a number of such returns. It was stated that, if it were not possible to burn the bad stuff at once in the furnace, it was allowed to accumulate, and was specially burned up. On the occasion of the seizure the stuff had been thrown out as the result of special examination. Another witness said it would be impossible to use bad apricot pulp in making jam. Ten per cent. was allowed to the trade for "throw-outs." The magistrate dismissed the summons, as he thought the defendants had shown that the stuff was not intended for use as food.

THE MEDICAL INSPECTION OF SCHOOL CHILDREN.

THE course of Lectures and Demonstrations on the Medical Inspection of School Children, organised by Mr. Wm. A. Lawton, the Executive Secretary of the Incorporated Society of Medical Officers of Health during Whit-week in London, were attended by Medical Officers of Health and School Inspectors from all parts of the country as may be seen from the following list:—

F. W. Andrew, M.R.C.S., L.R.C.P. Lond., M.O.H. Hendon U.D.; Ernest E. Argles, M.R.C.S., L.R.C.P. Lond.; Miles B. Arnold, M.D., M.B., Ch.B., D.P.H. Camb.; R. A. Askins, M.B.; L. M. Bowen-Jones, M.R.C.S., D.P.H., M.O.H. Carmarthen R.D.; R. H. Bremridge, M.A., Oxon., M.B., B.Ch., B.Sc. Lond., M.R.C.S., L.R.C.P. Lond.; Edgar J. Brown, M.B., B.S. Melb.; Albert H. Bygott, M.D. Lond., D.P.H. Birm.; Donald Campbell, M.D. Glasg., M.O.H. Calne R. & U.D.; George H. Carrington, M.R.C.S. Eng., D.P.H. R.C.P.S.I., M.O.H. Poole Boro' & Port; Frank E. Cane, L.R.C.P., L.R.C.S. Ed., D.P.H. Camb.; James Chronnell, M.R.C.S., L.R.C.P., M.O.H. Hindley U.D.; J. M. Clements, M.D., D.P.H.; Wm. McEntire Clendinnen, M.B., Ch. B. Birm., M.R.C.S., L.R.C.P. Lond., M.O.H. Coseley U.D.; Lewis A. Clutterbuck, M.D. Durh., M.R.C.P. Lond.; W. J. Corbett, F.R.C.S.I., L.R.C.P.I. & L.M.; Lewis D. Cruickshank, M.D. Aberd., M.B., Ch.B., D.P.H., Camb.; John W. Davies, L.R.C.P., M.R.C.S., M.O.H. Ebbw Vale U.D.; Ed. J. Day, M.D. Durh., M.R.C.S. Eng. & L.S.A., M.O.H. Dorchester; W. Lloyd Edwards, L.R.C.P., M.R.C.S., D.P.H., Deputy M.O.H. Barry, Glam.; Walter C. Garman, J.P., M.D. Edin., C.M., M.O.H. Wednesbury U.D.C.; Clarence I. Ellis, M.D. Aberd., C.M.; T. Evans, M.D.; Donald P. M. Farquharson, M.B., C.M. Edin., M.O.H. Radcliffe; Frederick I. Flower, M.R.C.S. Eng., L.S.A., M.O.H. Warminster R. & U.D.; William Foster, M.A. Camb., M.B., D.P.H., M.R.C.S. Eng., L.S.A., M.O.H. Shipley U.D.; Hubert R. R. Fowler, B.A. Camb., M.D. Dub., D.P.H.; Francis E. Fremantle, M.A., M.B., M.R.C.S., M.O.H. Hertfordshire C.C.; J. Albert Gibson, M.D., D.P.H., M.O.H. Isle of Wight R.D.; Arthur Greenhalgh, M.R.C.S., M.B., B.Ch., D.P.H., M.O.H., Accrington M.B.; Evan J. Griffiths, M.B., Ch.B.; William Gruggen, L.R.C.P.I., D.P.H., M.O.H. Middlesex & Herts C.S.D.; Octavius Hall, L.R.C.P., D.P.H., M.O.H. Devonport; David Havard, J.P., M.D., D.P.H., M.O.H. Cardigan R.D.; T. Barrett Heggs, M.D. Aberd., D.P.H., Camb., M.O.H. Milton & Sittingbourne C.S.D.; W. J. Henson, L.S.A., Wedmore; Richard Hickman, M.R.C.S., Eng., L.S.A.; Hy. Hardacre I. Hitchon, M.R.C.S., L.R.C.P., M.O.H. Heywood M.B.; Chas. Evan Humphreys, M.R.C.S. Eng., L.S.A., J.P., Co. Montg.; Joseph Brindley James, M.R.C.S. Eng., L.R.C.P.I.; D. Rocyn Jones, M.B.; Wm. Henry Kesteven, M.R.C.S. Eng. & L.S.A.; Arthur King, M.B., C.M., D.P.H., M.O.H. Watford U.D.; Leslie Kingsford, M.D., D.P.H., Assist. M.O.H. Liverpool, C.B.; J. Lambert, M.R.C.S., Brighton; Frederick Langmead, M.D. Lond., M.R.C.P. Lond.; Sidney C. Lawrence, M.B., Ch.B., D.P.H., M.O.H. Edmonton U.D.; Robert L. Legate, L.R.C.P., M.O.H. Christchurch U.D.; John Dickinson Leigh, M.D. Edin., F.R.C.S. Edin., C.M.; J. Hedley Marsh, M.R.C.S., L.R.C.P., M.O.H. Macclesfield M.B.; Thos. Muirhead Martin, M.D., C.M., L.M.; H. Mason, M.B., Ch.B. Edin.; D. Morley Mathieson, M.A., M.B., D.P.H., Town Hall, Norwich; Chas. J. R. McLean, M.D., D.P.H., M.O.H. Doncaster R. D. & Tickhill U.D.; F. N. Kay-Menzies, M.D. Edin., Ch.B., F.R.C.P. Edin., D.P.H. Depy. M.O.H. Stoke Newington; Ed. Rice Morgan, M.R.C.S., L.S.A., M.O.H. Swansea; Jno. Mudie Morris, M.A. Edin., M.B., C.M., D.P.H., Camb., M.O.H. Neath; J. D. Mortimer, M.B. Lond., F.R.C.S. Eng., L.S.A.; David C. Muir, M.D., D.P.H., M.O.H. Abertillery, U.D.; Charles Murray, M.A. Aberd., M.D., Ch.B., D.P.H.; Ernest Ed. Norman, M.B., B.S. Durh.; Alfred Chas. A. Packman,

M.D. Durh., M.R.C.S. Eng., M.O.H. Hoo, R.S.A.; W. Gibson Parker, M.B. Lond.; Leonard A. Parry, M.D. Lond., F.R.C.S. Eng.; Owen H. Peters, M.D., B.S., D.P.H. Camb.; Harry Garnet Phippen, M.R.C.S., L.R.C.P. Lond.; Ernest Geo. Pringle, M.D. Lond., M.R.C.S.; Sidney I. Pritchett, L.R.C.P., M.R.C.S., M.O.H. Rochester, M.B. and P.S.A.; Cecil Arthur Reynolds, B.A. Oxon., M.B., B.Ch., D.P.H.; Hy. Hugh Roberts, M.D., Ch.B. Edin., (Llanelly); M. K. Robinson, M.D., M.O.H. East Kent C.S.D.; Alfred Robinson, M.D., L.S. Sc., M.O.H. Rotherham, C.B.; W. Thos. Gardiner Robinson, M.D. Glasg., C.M., D.P.H. Camb., M.O.H. Poole R.D.; E. J. Slade-King, M.D., D.P.H., M.O.H. Ilfracombe; Edmund Moody Smith, M.D., D.P.H., M.O.H. York C.B.; Andrew Norris, Stevens, M.R.C.S., L.R.C.P. Lond., M.O.H. Gt. Yarmouth; T. H. Craig Stevenson, M.D., D.P.H., M.O.H. Somerset C.C. Education; George Stewart, M.B.; Percy H. Stirk, M.R.C.S., L.R.C.P. Lond.; F. W. S. Stone, L.R.C.P.I., L.R.C.S.I., & L.M.; F. E. Streeeton, L.R.C.P., M.R.C.S., D.P.H., M.O.H. Swindon, M.B., Highworth R.D.; Wm. Hy. Symons, M.D., D.P.H., F.I.C., M.O.H. Bath C.B.; J. W. Talent, M.D., D.P.H., M.O.H., Ashton-under-Lyne; J. S. Tew, J.P., M.D., D.P.H., M.O.H. West Kent C.S.D.; John Erskine Thomson, M.B., C.M. Ed.; Geo. Lewis Thompson, M.B., Ch.B. Edin.; C. L. Travis, L.R.C.P. Edin., M.R.C.S. Eng., D.P.H. Camb.; Philip Dymock Turner, M.D. Lond., M.R.C.S., M.O.H. Ryde Boro'; Geo. Wm. Whiteley, L.R.C.P., M.R.C.S. Eng.; Arthur Godfrey Wilkins, M.B., Ch.B. Vict.; D. Llewelyn Williams, F.R.C.S. Ed., L.R.C.P., M.O.H. Wrexham U. & R.D.; Samuel Williams, M.D. Lond.; Andrew Hamilton Wood, M.D., Edin. Ch.B.; Miss Martha Adams, M.B., Ch.B. Glasg., D.P.H. (Twickenham); Miss Catherine Boyd, M.B., B.Ch., B.A.O.R.U.I.; Miss Catherine Chisholm, B.A., M.B., B.Ch. Vict. Univ., Manchester; Miss Anna Dahms, M.D., Paris, L.R.C., I. & L.M. (Manchester); Miss Eliz. F. Elder, M.B., Ch.B. St. And. (Cardiff); Miss C. Fraser, N.B., Ch. B. Ed., D.P.H. Camb. (Birmingham); Miss Prudence E. Gaffikin, L.R.C.P. & S., Assistant Deputy M.O.H. Warrington; Miss Lilas Greig, M.B., Ch.B. Glasg., L.M. Dublin, D.P.H. Camb.; Dr. Mary Hunnan, L.R.C.P.I. & L.M., L.R.C.S.I. & L.M. (Maritzburg, Natal); Miss Margaret Hudson, B.A., M.B., B.S. Lond. (Hendon); Miss Edith A. Jones, M.B., B.S. Lond., (Bridgend); Miss Helena G. Jones, M.B., B.S. Lond., D.P.H. Camb., (King's Norton); Miss Myra Mackenzie, M.B., Ch.B. Aberd. (Newcastle, Staffs.); Miss Alice W. Maclean, M.B., Ch.B. Glasg., The Poor Law Hospital, Halifax; Miss Eliz. J. Moffett, M.D., B.Sc. Lond. (Bronesbury); Miss Mary E. H. Morris, M.B. Lond. (Bath); Miss Edith Oversley, M.B., Ch.B. Glasg., Toxteth Park Infirmary, Liverpool; Miss Agnes A. Parson, M.B., B.S. Lond., Union Hospital, Bradford; Miss Sophia Seekings, M.B., B.S. Lond. (Maida Vale); Miss Margaret Merry Smith, M.B., Ch. B. Ed., D.P.H. Ed. & Glas., P.H.O. Manchester; Miss Eleanor R. Sproull, M.B., Ch.B. Ed., D.P.H., Assist. M.O.H. Huddersfield; Miss Isobel A. Tate, M.D.R.U.I., B.Ch., B.A.O., D.P.H. Vict. Union Infirmary, Burnley; Miss Ada M. Whitlock, M.B., M.S. Lond. (Haywards Heath).

The opening meeting took place on Tuesday, June 9th, in the lecture room of the Incorporated Society of Medical Officers of Health, at No. 1, Upper Montague Street, Russell Square, when the gathering was welcomed by Dr. James Kerr, the chief medical officer of the London County Council and Fellow of the Society. Dr. Kerr also compared the methods employed by his department with those advocated by the Education Department.

The course extended from June 9th to 12th, and the following lectures were delivered:—
* "The History and Practice of School

Inspection," by C. J. Thomas, M.B., D.P.H., Assistant Medical Officer of the Education Department of the London County Council; "School and Home," by Dr. H. Meredith Richards, M.O.H., of Croydon; "Anthropometry," by Dr. F. C. Shrubbsall; "Eyes and Ears," by Dr. James Kerr; * "School Clinics," by A. H. Hogarth, B.A., M.B., D.P.H.; "Throat, Nose and Ears," by Mr. P. MacLeod Yearsley, F.R.C.S.; and "Reports and Office Routine," by E. Greer, Esq. Demonstrations of special cases and ringworm examination were dealt with by Drs. Kerr, Thomas, and J. A. H. Brincker at the L.C.C. Education Offices, Victoria Embankment. Visits were also made to the special schools of the London County Council.

A party visited the following schools in the company of Dr. J. A. H. Brincker, to whom we are indebted for the descriptive notes:—

THE CASSLAND ROAD SECONDARY SCHOOL.—This school is the most perfectly ventilated school on the plenum system of all the London schools. The party were shown how, by this method, the selection and amount of fresh air was absolutely under control, and how it was possible on a foggy day to enjoy a perfectly pure and clear atmosphere within the classrooms. The air is taken in at a spot 12 feet from the ground and well away from the street; it is drawn into the main duct by two powerful fans, 6 feet in diameter, and revolving at about 200 revolutions per minute. Before passing this fan, it has to pass through a revolving drum covered with sacking and kept wet by jets of water. In this way the air is freed from all dust, cooled, and saturated with moisture. Having entered the main duct, it passes along two branch ducts, in the walls of which are the verticle double ducts which supply in turn each class-room. Each of these branch ducts is divided by a horizontal platform, the upper half of which is supplied with coils of steam pipes from a horizontal Cornish boiler in a neighbouring boiler house, and the lower half has none. By varying the position of a slot, the temperature of the air entering this vertical duct can be regulated to a nicety, the temperature adopted in these schools being 62° F. The party were also shown how these vertical ducts were slotted and regulated to allow every room to be supplied with its adequate amount of fresh air. A visit was

then paid to the various class-rooms, halls, gymnasium and laboratories, and the principle of ventilation shown in each of them; they were shown that the fresh air enters by an opening 9 feet from the ground and carried in a forward and upward direction, and finally leaves by a similar opening almost immediately below the entrance, but on the ground floor. The air, having been given a certain momentum, retains this throughout its course, until it leaves the top of the shaft leading from this exit. The party were also shown how necessary it was that the doors and windows should be all kept shut, or all open, at any time, so as to prevent short-circuiting. How, in other words, the movements of a column of air simulated a current of electricity along a circuit of wires. They were also shown how pure the air of the room was kept by this principle, notwithstanding the fact that the schoolroom was crowded with boys, the absence of dust, of any sign of stuffiness, or of scorching of the air met with in rooms heated by steam pipes. Attention was next directed to the kind of desk used in this school, which was the usual dual desk; the method of lighting of school-rooms; the furniture required for schoolrooms and laboratories, etc.

Next in order the party visited the Homerton College, a residential school for mentally defective and deaf children. They were shown the methods of education adopted, and how the child was taught to produce the various sounds, aspirates, gutturals, etc.; also how the child was made to develop all its faculties, observation, speech, writing and action, during every stage of its education. Next came the teaching of arithmetic by factorisation into tens, etc. Finally they were shown some statistics as to what became of these children when they left school at sixteen.

The party were then taken over the physically defective school at College Lane. Here they were shown what could be done to make a child, though crippled, happy and contented, and to give it an opportunity of being taught a little useful knowledge in proportion to its health and strength. As a considerable amount of ignorance exists in regard to these schools, it may be as well to state that no child is admitted into one of these schools until it has passed one of the Council's doctors as suitable for a modified education at such a school. These schools are usually limited to about sixty children, and are in charge of a very competent lady head teacher and

qualified nurse. The children are fetched from their homes and returned there in a horsed ambulance in charge of the school nurse. The hours are 9.30 till 3.30, and they receive a very good midday meal at the school, consisting of meat or fish, two vegetables, bread and pudding. One of the doctors of the Council visits these schools once a month and sees any cases reported to him by the nurse, and every child is seen by him at least once in six months and reported on in a medical history book kept for the purpose. He gives advice as to invaliding, treatment, amount and kind of physical exercise allowed, feeding, amount of rest and education, etc. The cases admitted here are such as would be excluded from an ordinary elementary school for fear of injury or overstrain. They include cases of general debility, cardiac disease after rheumatism or chorea, recovery from phthisis or other tuberculous disease, infantile or other paralysis, etc.* Many of these cases are often very much better in a school of this kind than if kept at home; for experience has taught the Council doctor that if the child is kept at home its fresh air consists of street air. It may be used by an unscrupulous parent to run errands, or to carry the baby about, and it may not be fed in the right way. By attending school it is continuously under the nurse's care, the child receives the necessary fresh air, light, rest and feeding, in addition to the advice of the doctor, so that the proper treatment is ensured.

A party of medical officers visited the newest of the L.C.C. Special Schools, Osborn Place, Whitechapel, on June 12th, in company of Dr. A. H. Hogarth. The organisation, methods, and routine of both departments (Physically and Mentally Defective) were studied, and particular types of children were selected for demonstration. Then a journey was made to Christian Street School, where the plenum system of ventilation, as installed on the key principal, was investigated; and the morning ended with a visit to Finch Street Special School for Favus.

The party were entertained to luncheon at Toynbee Hall—the University settlement in East London, and afterwards visited the Elder Boys' Mentally Defective Centre at Berner Street, as well as the neighbouring laundry, cookery, and manual training centres.

Dr. Thomas accompanied a party to the Hugh Myddelton Elementary School, Mentally

Defective and Deaf, and Tavistock Place Physically Defective School.

The Tavistock Place Cripple School was the first physically defective centre opened in this or any other country. Originally worked in connection with the Passmore Edwards Settlement, under the direct influence of Mrs. Humphrey Ward, it was taken over by the London School Board. Now the L.C.C. has some twenty centres for these cripple children, who are collected and brought to school by ambulances managed by a trained nurse.

The Hugh Myddleton Deaf School.—The largest day school for the deaf in this country.

The Hugh Myddleton Special School for the Mentally Defective.—In these two latter schools cases of word deafness and word blindness were demonstrated.

The three departments of the Hugh Myddleton ordinary elementary school were visited, the general arrangements and physical exercises inspected, and a number of the children were put through a "preliminary" medical examination.

Dr. Clive Rivière's party visited a group of schools in the North and North-west of London. They first inspected the open-air school recently opened at Montpelier House, Brecknock Road. Here were found some seventy-five children "at school" in the ample grounds and gardens of the house. The premises were inspected, and details of the scheme, scholastic and medical, were, as far as possible, explained, together with the catering arrangements and their cost. The Brecknock Elementary School was then visited, and two of the departments having been inspected, the party passed on to the Brecknock School for the Mentally Deficient. Here the system of admission and note-taking was studied, and the scholars and their work inspected under the supervision of the head mistress. The blind school adjoining was taken next, and the working of the Braille system was seen in all its phases, and also the various manual crafts to which the children apply themselves. The "physically defective" school at Haverstock Hill was dealt with in the afternoon.

Dr. Niall escorted a party to the Birley House Open Air School, the Goodrich Road Mental Defective and to the Friern Elementary School and Physically Defective.

Dr. Janet Campbell, who was recently appointed to the Government Education

* A précis appears in the second number.

Department, took charge of the party of lady graduates visiting the special schools of the L.C.C.

The members were also invited to inspect the exhibit of the Hungarian Minister of Education at the Hungarian Exhibition at Earl's Court.

The final meeting took place at the rooms of the Incorporated Society of Medical Officers of Health, on June 12th, when Dr. James Kerr delivered a valedictory address. In the course of his remarks, Dr. Kerr emphasized the need of co-operation amongst medical inspectors and the necessity of being associated with some organisation capable of safeguarding their interests in the event of any questions arising. In proposing a vote of thanks to Dr. Kerr and all those who had taken part in the proceedings, Dr. Francis Fremantle, Medical Officer of Health to the Herts County Council, read the following resolution which had been passed at an informal meeting of the Fellows of the Incorporated Society of Medical Officers of Health attending the course:

That this meeting of Fellows of the Society of Medical Officers of Health attending the course of lectures on the Medical Inspection of School Children, hereby urgently request the Council to form a School Medical Officers' Section of the Society, and would suggest that Dr. James Kerr be asked to accept office as first chairman of the section.

Dr. Sidney C. Lawrence, Medical Officer of Health of Edmonton Urban District, in seconding the resolution, made reference to the able manner in which the whole of the arrangements in connection with the course had been organized by Mr. Wm. A. Lawton, and the motion was carried with acclamation. Dr. Kerr briefly replied.

Club rooms were provided for the lady graduates attending the course, at the rooms of the Society of Medical Officers of Health, which had been handsomely furnished and decorated by Messrs. Defries. An exhibition of appliances and materials in connection with the Medical Inspection of Schools was also organized at the same address, and Dr. Kerr took the opportunity of demonstrating the use of some of the special apparatus on view. Among the exhibits were Wingen's light testing apparatus by A. Kriess, Hamburg; light saving shadowless globes, as used by the London County Council; weighing machines and measuring apparatus by W. and T. Avery, Ltd., of Birmingham; Day and Millward, of

Birmingham; Aston and Manders, of London; measuring apparatus, by John Rabone and Sons, Birmingham; outfits for school medical inspectors, by F. Davidson and Co., of London; dental charts by the School Dentists' Association and Prof. Dr. Jessen and Dr. Stehle, of Strasburg; record systems and registers, by Charles Knight and Co., Ltd., London; index cards and record systems by the Specialist Press, Ltd., London; microscopes and bacteriological apparatus by Charles Baker, of High Holborn, who also provided the microscopes that were used for the examination of ringworm, etc., at the L.C.C. Education Offices; Equifex disinfecting apparatus and pasteur filters by J. Defries, London; special disinfectants for schools were also exhibited by Jeyes Sanitary Compounds Co., Ltd., Newton Chambers and Co., and the Sanitas Co., Ltd.; typewriters by the Blickensderfer Typewriter Co., Ltd., London; duplicating apparatus by the Typograph Co., Ltd., London.

DEAFNESS AND MENTAL DEFICIENCY IN SCHOOL CHILDREN.—Dr. Franz Kobrak, of Breslau, publishes in the *Zeitschrift für Schulgesundheitspflege* for February, 1908, the results of his inquiries into the relation between hardness of hearing and mental defect. He examined the 677 children in the defective schools (Hilfsklassen) of Breslau, using the voice test for hearing, and out of these 77 showed considerable hardness of hearing. He next divided the whole of the children into two classes according to whether they were making good progress in school or not; 139 children, or 20 per cent., were making good progress, but amongst the partially deaf children no less than 25 per cent. were making good progress, as compared with only 17 per cent. amongst those with good hearing. He deduces from this that a large proportion of the partially deaf children in defective classes are really naturally bright children who have never had a fair chance. He further points out that in the ordinary school there are many children who are kept back on account of poor hearing. He suggests that all partially deaf children in the ordinary schools who are behind their proper class or class position and all the similar children in the special classes who are making good progress should be brought together in a class for the partially deaf. In this way not only would they benefit greatly educationally, but they could be kept under better supervision, and pressure to obtain such ameliorative or curative treatment as might be indicated would be more easy to apply.

THE HISTORY AND PRACTICE OF SCHOOL INSPECTION.*

By C. J. THOMAS, M.B., B.Sc., D.P.H.,
Assistant Medical Officer to the Education Department
of the London County Council.

MEDICAL INSPECTION is the natural outcome of the public provision of education, compulsory upon the whole population between certain ages. The interference with natural conditions and the alteration in environment which that brought about at the very period when the individual is most susceptible to external influences, should have required from the beginning the aid and guidance of the physiologist and the physician. This aid was not sought; education was arranged upon clerical lines, physiology ignored; child study considered unnecessary.

This un wisdom in the beginning necessarily led to evil results, and suspicions arose in the minds of the educators themselves; the poverty of results, the growing certainty of the existence of school-made diseases, produced an alteration in outlook. Child study began to be a reality; attention for the first time was paid to eugenics, and the aid of the physician began more and more to be sought.

England was not the first country to begin to take up this attitude; she is the latest to do so. Neither, however, was it one of the other great military or naval Powers; the work began in the smaller countries. To Sweden we are indebted more than to any other land. There the importance of the physical development of the human body was first seen, and there, in the early years of the last century, physical exercises became universal, and in 1863, children began to be examined for fitness to perform physical exercises. The advantage of this examination was quickly perceived, and from 1878 the health of each child has been examined at the beginning of each school term. The term "school doctor," moreover, was first used in Sweden.

Brussels commenced, in 1874, the medical examination of school children, and was followed by the other great Belgian cities.

In France, although regulations had been framed for the conduct of school physicians in 1833, medical inspection does not appear to have been carried out until it was begun in Paris in 1884, and spread over France later by general decree.

*A Lecture delivered at the Rooms of the Society of Medical Officers of Health on June 10th, 1908.

In Germany—in Wurtemberg—a certain amount of medical inspection was commenced in 1875. Leipzig was the first noteworthy city to begin in 1889, quickly followed by Saxon towns such as Dresden, and in 1890 it was carried on in some fashion in three great German towns—namely, Leipzig, Nuremberg, and Dresden; then in this year (1890) something occurred which stirred matters up considerably in Germany, and lit a fire which soon spread over the civilised world. This was again due to Scandinavian influence. Professor Axel Key, of Stockholm, visited Berlin, and gave an account of his work and the revelations of unfitness brought to light by himself and by Axel Hertel, in Denmark.

The revelations caused much speculation as to actual conditions in Germany, and Wiesbaden commenced medical inspection on a scale never hitherto attempted. The methods and results in Wiesbaden, which were published in 1897, were so striking that all the German towns began quickly to take up the work, so that now there are school doctors in that country in 260 townships or more. The Wiesbaden experience has had an immense influence in the development of medical inspection, and its system is seen reflected, to some extent, in the schedule which the Board of Education has issued, and which is to form the pattern for work all over England and Wales. To cut a long story short, it needs only to point out that, before our country had really thought about it, medical inspection was already practised, in addition to the countries named, very thoroughly in Switzerland, especially in Zurich, Lucerne, Neufchatel, and the canton of Zug; in Norway since 1891 (where the school doctor's functions are defined on a larger scale than perhaps anywhere else, as he is, in addition to medical inspector, the educational inspector of physical exercises, of manual employments and school work generally); in Roumania from 1899; in Chili; in the Argentine Republic from 1894, after Dr. Coni had gratuitously, for some time, carried on medical inspection, and demonstrated its vital importance to the State—one of the many examples of how devotion to the ideal has actuated members of the medical profession, who have given of their best without asking, expecting, or receiving any return; in the greater cities of the United States, beginning with Boston, in 1894, and being followed by Chicago and New York, daily inspection is the practice; in Japan, where, by Imperial

decree, from 1894 all districts with over 5,000 inhabitants have been compelled to appoint school doctors, so that very quickly nearly 9,000 school doctors were at work; and, in fact, in every civilized country in the world to a greater extent than in our own.

In our own country in 1893, Dr. Kerr was appointed by the Bradford School Board, and was the first medical man to go daily into the elementary schools, and study, in the light of modern medical and physiological knowledge, the condition of the children and the educational methods in vogue. In London in 1891, a medical officer was appointed to the school board, and in 1902 Dr. Kerr was transferred here. Before that year the London School Board had already appointed two examiners of special schools and a ringworm nurse, but after Dr. Kerr's appointment the department quickly began to grow; he was given assistants; six "occulists" were appointed to supervise the vision testing; the number of school nurses was increased, until, in 1904, in addition to four permanent assistants, there were twenty local medical inspectors appointed, and the number of school nurses rose to more than thirty.

Meanwhile work was beginning to be done in some of the large centres in the country; pioneer work in the direction of convalescent schools and a country school for town children was accomplished in Manchester; Dr. Crowley continued Dr. Kerr's work in Bradford; a beginning in the direction of school clinics has been made in Cambridge; and the municipal treatment of ringworm established in Croydon.

Leading up to the establishment of medical inspection in England, we had, therefore, the following factors:—

Firstly, there was an increasing body of knowledge resulting from the reports of medical officers, especially those of Dr. Kerr, and the work in Scotland done under the direction of Dr. Leslie McKenzie;

Secondly, there were the rumours of the advances made in other countries, culminating in the first International Congress of School Hygiene, which met in Nuremburg in 1904, organized by Prof. Griesbach, and attended by many delegates from this country;

Thirdly, as a result of the Education (Defective and Epileptic) Act of 1899,

many medical examiners were appointed, and the opportunity of the medical profession to get into contact with educational methods increased;

Fourthly, the revelations in connection with the recruiting for the Boer War, raised great heart-searchings on every hand with regard to our national efficiency and physique, and led to a greater interest in the case for the study of development of children; and

Finally, Royal Commissions and Inter-departmental Committees followed one another rapidly, and strongly recommended, in their reports, medical inspection of school children—namely, the Scotch Physical Education Committee, the Royal Commission on Physical Degeneration, the Inter-departmental Committee on Physical Exercises, and the Committee on the Feeding and Medical Inspection of School Children.

During 1905–6 there were several deputations of medical and scientific men to the Board of Education, and the result was seen in Mr. Birrell's Education Bill for 1906, in which an enabling clause for medical inspection was inserted. When it came to be discussed in the House of Commons, however, from every section and shade of political opinion expressions were made as to the necessity of medical inspection, and at the end of the sitting Mr. Birrell accepted the principle of compulsory medical inspection, with an enabling clause empowering local authorities to make provision for treatment. The Bill of 1906, unfortunately, did not pass. In 1907, however, the clauses relating to medical inspection were brought up as a private Member's Bill by Mr. Russell Rea, and, having passed by the House of Commons without opposition, were incorporated in the Government's Administrative Provisions Bill of 1907 by Mr. McKenna, and became law.

The aims of Medical Inspection are threefold:

1. To advise alterations in curriculum adapted to special needs of the child—exclusion from school altogether, admission to special classes, exemption from special subjects, the allotment of special positions in class, and to indicate harm already done to particular children by school methods in vogue.

2. To obtain treatment or amelioration of defects after demonstrating their existence.

3. To collect statistics for national use, showing how different environments act upon growing organisms; to compare town and country, town and town, and especially decade with decade.

Details.—The difficulty in the minds of many is how to reconcile the filling up of the twenty-four to thirty items on the card with the expression of opinion in the accompanying memorandum that the examination of each child need only take a few minutes.

It is weary work filling in schedule after schedule for similar children; it is intolerable to go on doing this day after day, and can only lead to mental breakdown on the part of the inspector. The medical inspector must be set free to learn something of educational methods, of school conditions, and given time for original research. He is to develop into the school doctor of the future, who as physiologist is the natural educational adviser of the education authority.

I find myself that an adequate preliminary inspection of a child can be performed in considerably under five minutes—that is, at least twenty-five to thirty children per session. (In some German towns where it is admirably done, a class of forty-five can be done in the two hours).

Records.—Cards and cabinets are the only records necessary or admissible; have nothing to do with registers for this work. Different colours should be used for boys and girls—e.g., in London we use light blue for males, and white for females. One corner of the card should be snipped off—preferably the right-hand top corner—for purposes of orientation when shuffling the cards for results.

Presence of Parent.—I would strongly recommend that the inspection be done in two visits. I would have a preliminary run, as rapidly as consonant with efficiency, over all the children in the district who are to be inspected; a special mark should be placed on the card of each child whom this preliminary inspection shows to be desirable to be examined more fully. The presence of parents is not essential at this first examination; but at the second visit, where only those whom it may be necessary to examine more fully are dealt with, the parent should be present if possible.

Suppose $2\frac{1}{2}$ minutes per child is taken over the first examination, that gives 250 minutes per 100. At the second examination ten of these are given another 5 minutes=50 minutes—300 minutes in all. Now each child has been inspected, 3 minutes each taken per child, and yet the worst children have had $7\frac{1}{2}$ minutes devoted to them. These figures are merely illustrative, and not to be taken as necessarily the actual times or proportions. (I find it possible to do the necessary preliminary inspection in just under 2 minutes.) It must be remembered that accurate diagnosis is not asked of you, but only to establish the presence of, and roughly the degree of, ill health, and the direction in which further investigation is necessary, so that a well-founded reason may be given for reference to the private practitioner or hospital (at present) for further exploration and treatment.

Now let us take the items of the schedule in detail:—

The items capable of being filled in by teacher or school nurse should be grouped together at the beginning and separated by a thick line from those following. After item 16 a thick line should again be drawn across the card. The preliminary inspection should deal only with the items between these two lines, say from 8 to 16 inclusive, practically no stripping being necessary.

Let us now take the items in order:—

1. *Date.*—This should already be filled in by assistant, together with the remaining items above the first thick line.

2. *Standard and Regularity of Attendance.*—This will only be possible at further examinations, not in entrants; regularity of attendance should be expressed as a fraction, e.g. $\frac{11}{12}$, actual attendance being the numerator, possible attendances being the denominator.

3. *Age.*—This should be stamped, preferably in red ink, so far as the year of age is concerned; when reports come to be made out everything must be distributed according to age and sex, otherwise statistics are valueless. It will, therefore, greatly facilitate sorting if the age is the most prominent item on the card, the sex being already denoted by the tint of the card.

4. *Clothing and Footgear.*—Wherever possible for the sake of rapidity of recording, all conditions at the preliminary examination should be assessed by a system of marks from

1 up to 5. Thus, in inquiries I have carried out, 1 has denoted clothing of the scantiest possible, one ragged coat buttoned up and practically nothing beneath, boots either absent or represented by a mass of rags tied upon the feet; 2 has denoted clothing insufficient to retain animal heat and needing urgent remedy; boots leaking; 3, clothing poor but passable, an old and perhaps ragged suit, with some attempt at proper underclothing—usually of flannelette; 4, well clad, stuff suit, good boots, with a flannel undergarment, or a guernsey; poor, perhaps, but sufficient; 5, very well clad. In using a system of marks such as this, any momentary hesitation is solved by leaning towards the centre mark. Some inspectors prefer the use of the symbols +, O, and —, to the numerals.

5 and 6. *Height and Weight.*—There are to be three examinations during school life at present. Records of height and weight at these long periods are useless for the child itself, especially as there are no standards available, nor can they give adequate data for statistics. Why then are they introduced? Partly possibly to the influence of Wiesbaden (where they are measured every half year), but chiefly owing to the determination of the Board, no doubt, that a commencement must be made in the direction of anthropometry. There must be a supply of weighing and measuring instruments, and whenever teachers are willing to measure and make records of their children at regular intervals they should be encouraged to do so. I believe the Board will be better satisfied if a start on real scientific anthropometry be made and incorporated in your report. This entails less work, is interesting, and will commence a standard for your neighbourhood with which individual weighings can later be compared. On no account should weighing and measuring be part of the rapid preliminary inspection to which I am referring.

7. *Nutrition.*—Here again marks should be used. This is a very difficult thing to assess and should on no account be left to the unqualified assistant. Important action may be based upon the findings, such as reference to feeding committees or to the Society for Prevention of Cruelty. The colour of mucous membranes is very important in this connection. Children selected on this account as anæmic for open-air schools in London, turned out in every instance to have insufficient

hæmoglobin when later tested by Tallgoist's method. Palpitation of the scapula through the clothes is also a useful guide. (If when the child is standing erect a thumb is placed in contact with either inferior scapular angle, important indications as to torsion of the spine are obtained.)

8. *Cleanliness.*—Marks again should be used here from 1 very dirty to 5 perfectly clean. The head should be noted if scurf is present, for in the majority of instances this is due to chronic ringworm in children, only to be dismissed after microscopical examination. (A little of the scurf, which often contains short stumps only seen after soaking in potash, being placed in a small envelope, labelled with the name of the child and carried away for examination at home.) The presence of parasites should be noted by V for vermin and N for nits. With regard to the body the hem of the undergarment can be fished up nearly always without undressing and examined.

9. *Teeth.*—It is unnecessary to count the numbers of temporary and permanent teeth decayed as some schedules I have seen contemplate. With regard to conservative treatment a single decayed tooth presents a better field for operation than a considerable number. A peep inside the mouth is all that is required. Marks 5 represent a perfect set of teeth; 4 if caries has appeared ever so slightly; 3 if there are several decayed teeth not impairing the bite to any extent; 2 where several decayed teeth affect powers of mastication; 1 where practically all teeth are affected.

10. *Nose and Throat.*—The great point to determine is *obstruction*, partial or complete. The tonsils should not be examined as routine, but at the fuller examination where indicated. Gardeners' wooden labels should be used as recommended by Dr. Richards and thrown away after use. Six-inch wooden labels should be ordered. Glands—marks 2 unduly palpable, 3 enlarged to size of pigeon's egg.

11. *External Eye Disease* need not be thought about unless present when it is seen at a glance.

12. *Vision.*—Snellen's test types should be used; the teacher or school nurse should undertake the preliminary examination. In London the teachers have done this satisfactorily for years. No test can be carried out in the case of entrants or infants generally. As a routine thing it is found sufficient to test both eyes

together, not separately. When testing each eye separately the time is very much more than doubled, unusual conditions which are never present are introduced, and anomalous results are often obtained. A useful addition to the inspector's equipment is a set of capital E's made to the dimensions of the test types, which can be rotated and the child asked to indicate with his fingers the direction in which the arms of the E point. This gets rid of the possibility of cheating on the part of the child and can be used in the case of the deaf or of a child who does not know his letters. When squint is present (it often goes with adenoids) it can hardly be overlooked.

13. *Ear Disease.*—The only preliminary investigation necessary is the noting whether discharge is present.

14. *Hearing.*—An important part of the inspection is the asking of the child in a low and gentle voice, as soon as he is presented, a few questions as to name, age, and where he lives. His responses give sufficient clues to this and the two following items. The presence of the parent interferes with the smoothness of working of this, as she invariably persists in breaking in and giving the responses herself. Where deficiency of hearing is suspected, the child should be tested by the forced whisper at a distance of twenty feet—this is the only hearing test suitable for school work; the child is asked to repeat numerals whispered by the examiner at the termination of an ordinary expiration.

15. *Speech.*—The one thing mostly pronounced badly by a child is his own name, and the first step in the inspection is asking the child this; a further test when desirable is asking the child to count or repeat the numerals up to ten; the English numerals contain most of the difficult consonantal sounds.

16. *Mental Condition.*—The assessment of this again largely depends upon the nature of the response. A separate and thorough examination at another time should be carried out of all children suspected of mental defect after a period of a year in school. A special report is required by the Board of this condition.

It will be noted that many of these items are inadmissible at the examination of entrants, which is the chief examination for the present year, and the work is thereby lightened considerably.

Histories.—Having decided what items you

wish for information about, a form should be got out, and when a child is presented for admission to school the parent should be handed this form to fill up, and it should be understood that the child is not properly admitted until this is done. Experience shows that while not 25 per cent. of parents will attend the preliminary examination, yet 85 per cent. are willing to fill up a history form to the best of their ability at home. It is worth while getting a history of measles in every case, this being the complaint that gives most trouble in school life.

The Teachers.—As far as possible the normal life of school should be not interfered with. The teachers should be looked upon as colleagues, equal in all respect and the utmost frankness and deference should be used in dealings with them. Generally you will find the teachers very interested and very anxious to help.

Before concluding, I should like to say a word respecting the importance of rheumatism in childhood, a disease which, more than any other, produces silent ravages which can never be repaired. This should be borne in mind in every case of unexplained debility, pallor, or ill health. Generally a satisfactory preliminary examination of the heart can be made by throwing a towel over the chest and listening directly with the ear over the clothes; a murmur can often be thus distinguished; the heart sounds can always be heard, and any irregularity, undue frequency, or unsatisfactory clarity of the sounds in a moment detected, leading, where necessary, to a fuller examination.

UNDERGROUND BAKEHOUSE.—At Marlborough Street Police Court, on April 2nd, the Ritz Hotel, Ltd., were summoned by the Westminster Borough Council for using an underground bakehouse contrary to the provisions of the Factory and Workshop Act, 1901, which provides that an underground bakehouse shall not be used. The bakehouse was part of the kitchen arrangements of the Ritz Hotel, and was used for the supply of bread to the hotel visitors and to the staff. The magistrates dismissed the summons without costs, and expressed his willingness to state a case. In his judgment he said that he had come to the conclusion that there was no direct sale of bread or direct profit from it in this case. The supply of bread was part of the general business of the hotel in receiving the guests properly. There was no more a sale than that of the salt or pepper. He must look at the substantial object of the bakehouse, which it had been shown was for the supply of the staff to the extent of three-quarters of its output, only one quarter being used by the guests.

SCHOOL CLINICS:

OR CENTRES FOR THE MEDICAL TREATMENT OF SCHOOL CHILDREN IN POPULOUS DISTRICTS.*

By A. H. HOGARTH, M.B., B.Ch., D.P.H.

County Medical Officer of Health, Buckinghamshire.

It is now universally recognised that medical inspection of schools forms an integral part of every modern system of education. But medical inspection is only a single branch of school hygiene. As long as there are in the schools children suffering from preventable and remediable diseases, of which both the parents and the teachers are ignorant, so long systematic medical inspection can be justified as a State institution. The aim of school hygiene must be to improve the conditions of mental, moral, and physical development, to prevent disease in childhood, and finally to lead to a science of education.

But, even in this one branch of school hygiene, medical inspection by itself is insufficient: medical treatment is its natural corollary. But experience in the populous districts of England shows that less than one-sixth of the defective children discovered by inspection are actually treated. Many of the children are not even presented for treatment, while many others are not efficiently treated, or, at all events, are not materially benefited.

The chronic diseases of children requiring treatment are parasitic and contagious infections, defective vision, carious teeth, chronic diseases of the eye, ear, throat, and skin; and for all these chronic conditions the existing means for treatment are wholly inadequate. There are family doctors, hospitals, and Poor Law dispensaries, none of which really fulfil the requirements. The family doctor does not exist in the homes of the poor, and even a little higher in the social scale it is unreasonable to expect him to prescribe for children with defective vision or to treat such chronic complaints as discharging ears. He gives a bottle of medicine and advice which, for a multitude of reasons, is not followed. Anything more is a labour of love.

Then, again, hospitals are not suitable places for the treatment of such cases. That is not their *raison d'être*. The very weight of numbers is too great, the cases are too chronic, and the treatment too tedious for voluntary workers.

Precis of a lecture delivered at the rooms of the Society of Medical Officers of Health on June 11th, 1908.

Moreover, the central hospitals are quite inaccessible for the people living in outlying districts, and many of the patients must be kept waiting an inordinate length of time. But even so, many of these children who do attend hospitals are inadequately treated and not materially benefited, whilst on the other hand Education Committees frequently receive serious complaints about the large numbers of school children applying for hospital treatment.

The Poor Law Dispensaries, of course, are wholly unsuitable for the treatment of school children, nor do they appear capable of adequate re-organisation under existing social conditions.

Ignorance, apathy, and neglect of parents, inadequacy and inaccessibility of existing institutions, real poverty of the people, the tedious nature of efficient treatment for these chronic cases, and the general standing of the medical practitioner in poor districts are factors hindering treatment; so much so that even a decent and respectable poor parent has the utmost difficulty in obtaining efficient medical treatment for his children. Apathy and neglect is the natural result.

The individualist solves the problem thus: "Leave all to time and to general social evolution. There is no short cut to social reform. Why was not this appalling need for treatment discovered thirty years ago? Give us time, the strength of the people lies in the family."

Another plan is to exclude all children suffering from such defects from school and to summon the parents for their non-attendance. But it is essential to show the parent how it is possible for him to obtain the necessary treatment for his children. This plan has been tried and found wanting, and, in the case of teeth especially, it is impossible for any of the existing institutions to provide the necessary facilities.

On the other hand the socialist demands the municipalisation of all medical services, including treatment—a suggestion which, at present, cannot be supported even on superficial grounds.

The only practical remedy lies in the establishment of school clinics or centres for the medical treatment of school children under the guidance, direction and control of the Education Authority. The school clinic should be modelled partly on the special clinics for the treatment of teeth at Strassburg, Bâle, Lucerne, and Zurich, and partly on the lines of the

general school-polyclinics which have been established in Switzerland at Lucerne, La Chaux-de-Fonds and Neuchâtel. These latter exist chiefly as consulting rooms for the school doctor, and only secondarily for actual treatment of a few parasitic and minor affections. The ideal clinic would consist of a small building of five or six rooms—a large waiting hall and dispensary, consulting rooms for physician and for dentist, one dark room with special apparatus for examining eyes, throats, ears, etc., and a room for dental and other minor operations. A trained nurse should be in charge under the direction of the responsible medical officer of the education authority. Two days a week for the teeth, one for the eyes, another for the throats and ears, and two for the other general conditions. These rough particulars will afford some idea of the organisation that will be required; but the exact details will depend on local conditions and requirements.

Additional Advantages.—In addition, the school clinic offers the following advantages:—

1. It will serve as a convenient place for further detailed examination of all children discovered to be defective on and after admission.
2. There will be little interference with school routine.
3. Absences of children attending hospital, etc., will be more under control.
4. Better accommodation for the work of the school nurse in connection with parasitic and contagious diseases.
5. The district school doctor, the school nurse, and the attendance officer could conveniently attend the consultations of the visiting physicians so that greater co-operation may result.
- (6). The general simplicity and uniformity of the system offer unique advantages.

There is no need for further details at present until the following principles have been accepted; first, that school clinics shall be established in populous districts under the control of education committees for the treatment of certain specified conditions, and that all treatment shall be gratis (though cost price should be charged for the provision of spectacles, etc.) Attendance should not be compulsory, but the education authority should have legal powers to enforce the efficient treatment of all defective school children; failing this they should be excluded from school and the parents summoned.

SCHOOL DOCTORS IN GERMANY.*

THE Board of Education have recently placed on sale a pamphlet with the above title, which is No. 4 of the Board's series of Educational Pamphlets. The pamphlet, which is the work of Mr. W. H. Dawson, gives some interesting information on the progress of school hygiene in Germany, and it is well worth the attention of all who are interested in this important branch of public health work. The following extracts will indicate the nature of the information contained in the pamphlet.

While humanitarian considerations have no doubt largely influenced public opinion in favour of the employment of school doctors in Germany, the strongest, the determining motive has been the recognition of medical supervision of school children as a logical consequence of the State's appropriation of the school as its peculiar concern.

If the State—so the argument runs—requires the unintermittent attendance at school of children from tender age onward for a period of six, seven and eight years, it incurs a large measure of direct responsibility for their physical welfare, and at least it is morally bound to take due precautions that injury to health shall not befall those whom it may be said, to some extent, to withdraw from parental care and oversight. And not only is this responsibility held to apply to the surroundings in which the child passes so many of its years—the buildings, the classrooms, the playgrounds, the right ordering of which involves questions of sanitation, ventilation, lighting, heating, and the like—but it is held to embrace no less the pathological aspect of the question, as implied by the influence of school life and discipline upon the health of body and mind.

THE FIRST EXAMINATION.

It is regarded as essential that the first examination should take place as early as possible after a child has reached school age, and most towns which have instituted it require it to follow immediately on the admission of the child. Some towns have two examinations of newly admitted children—the first a more or less cursory one, with a view to determining which children should, for reasons easily detected, be put back for half a year or a year as the case may be, and the second a thorough examination with a view to obtaining a full record of the child's physical and mental constitution, as a guide to the plan of instruction to be followed. The interval which falls between the first and second examinations, of course, allows time for careful observation.

This double method is followed at Frankfurt-on-Main amongst other places.

In Berlin the plan has hitherto been followed of submitting to a preliminary examination all

* School Doctors in Germany. — Board of Education's Educational Pamphlets, No. 4. Printed for His Majesty's Stationery Office by Wyman & Sons. Price 6d.

children whom, on the ground of suspected unfitness, the chairmen of the District School Committees refer to the school doctors on their first notification (*Anmeldung*) as liable to attend school, or whom the head-master reports after their formal admission. In addition, the school doctors have to examine the whole of the newly admitted children as soon as possible after the beginning of every school term. The practice of doing this at school has, however, proved inconvenient, inasmuch as it seriously disturbs work, and some of the doctors began to do the work at their own homes.

But Berlin lives on the flat system, and the incursion of innumerable school children and their parents into the well-appointed halls, corridors and stairs leading to the doctors' dwellings proved a great nuisance, and caused an outcry on the part both of neighbours and of landlords. It is, therefore, for the present uncertain which system will prevail.

The admission of children takes place in Berlin each half year, but whatever the period for which these children are put back—whether half a year or less—they are re-examined at its expiration.

The regulation of Nuremberg runs:—

"The first examination is made at the beginning of the school year (August) and must be completed by the end of September. It consists of an external revision of the children, and its purpose is to determine whether they are fit for school, that is, whether their physical and mental development will allow of their receiving instruction successfully and without injury. Should the school doctor, in agreement with the teacher, find that it is necessary to put back a child for a year, in its own interest and in that of the school, he affirms this by means of a certificate whose contents shall be brought to the knowledge of the child's relatives by the inspector. It is then the duty of the inspector to take the requisite steps accordingly."

A second thorough examination is made before the ending of the first half year, and a supplementary examination during the second half year, this latter including sight and hearing.

On the other hand, some towns have adopted the still more efficient plan of having children examined in every case before they are admitted to school, so that work may not in any way be disturbed by withdrawals after the school term has begun. One such regulation (Schöneberg, near Berlin) runs:—

"The School Doctor has to examine every child who is notified for admission to school before formal admission in regard to its fitness for school."

THE HEALTH CERTIFICATE.

The Wiesbaden health form has been adopted, with slight modifications, by a large number of German towns. Indeed, it may fairly be said that both the theory and the practice of that town are representative of the best work in the domain of what is known as "school hygiene" which is being done in Germany at the present time.

As to a child's "general constitution," Wiesbaden recognises three grades of efficiency—good, medium, and bad. A constitution is described as

"good" when the condition of health is absolutely perfect, and as "bad" when chronic weakness or evident disposition to illness exists. The classification may appear too summary, yet it has been found to serve for practical purposes.

In the determination of a child's "mental constitution," the usual classification is into normal, backward (and so suited to the auxiliary classes), and defective (and so unsuited to attendance at an ordinary school).

RE-EXAMINATIONS.

The sequence of re-examinations, which is part of the Wiesbaden system, has not as yet been generally introduced in Germany, but most of the towns which have appointed school doctors are step by step advancing to it. In Wiesbaden, the re-examination takes place in the third, fifth, and eighth school years; and this order has widely been followed; other towns require it in the third, fourth, and fifth, in the fourth and seventh, and so on. But in every case a re-examination has to take cognisance of the earlier examinations. Thus the Wiesbaden regulations state:—

"It is specially to be noted and recorded in the health certificate, whether and in what way earlier observed maladies have changed. The entire constitution and any change in the same have in any case to be recorded. A special report is to be made on each investigation of later years and is to be handed to the senior school doctor."

Great value attaches to the examinations in later school years, inasmuch as, if the whole health record has been carefully kept, they are expected to afford important guidance in the difficult question of the choice of occupation and vocation—a matter in which German parents are also helped by a varied and increasing literature. Yet, as a rule, the school doctors only advise in this responsible matter when requested by parents or teachers, and their advice is mainly of a critical and negative kind, viz., passing judgment upon the parental plans and proposals which may be submitted to them.

Specimen regulations are as follows:

WIESBADEN.

"It is desirable that after the examination of the scholars of the eighth year, whose discharge from school is imminent, a formal judgment upon the child's entire physical development during his school life should be entered upon his health certificate with due consideration of the noteworthy illnesses which may have occurred during that time, and which it is the duty of the form teacher to record."

STETTIN.

"On request, medical advice as to the choice of a calling is given to children leaving school."

NUREMBERG.

"In the last quarter year before a child leaves school the school doctor shall, at the request of the parents, make a careful examination, on the strength of which he shall give advice as to the choice of a suitable occupation."

Other towns only arrange for this special leaving examination and offer of advice by the

school doctor in the case of children who, owing to delicate health or defective faculties, have been under continuous medical oversight. At the same time, the public aspect of the question is not ignored, and one of the conscious motives which actuate many school authorities is the desire to protect the community against injury, where children suffer from chronic disease like tuberculosis and skin affections.

RESULTS OF THE EXAMINATIONS.

As to the importance and value of these medical examinations in general, opinion is unanimous and emphatic. Again and again it happens in the experience of most school authorities which have adopted the institution that weaknesses are brought to light of which both teachers and parents have been ignorant, yet which have a deterrent influence upon the children's education, and which if neglected, would probably disable them in after life. Thus during the first year (1902-3) of the employment of school doctors in Berlin 12.3 per cent. of all the children notified for primary admission in school had to be put back for varying terms. In 26 per cent. of the cases the reason was general physical weakness; in 16 per cent. it was recent serious illness; in 16 per cent. delicate constitution (rickets, scrofula, and anæmia); in 10 per cent. insufficient development; in 5 per cent. tuberculosis of the lungs; and other causes were weakness of the heart, epilepsy, nervous maladies, skin diseases, and defective articulation.

In 1904-5 the number of newly registered children examined in Berlin was 34,562 (17,236 boys and 17,326 girls), or 960 to each school doctor; and of these 2,927 or 8.5 per cent., were put back, while 7,041 were placed under oversight, making the total number under oversight in that year 24,225, or 673 to each school doctor. The cause was defective sight in 22.4 per cent. and general weakness in 13 per cent. of the cases.

Moreover, 702 children attached to the auxiliary classes were examined, with 320 children who received instruction in the special classes for stammerers, and 21,365 other examinations were made by the doctors, at the request of the head teachers or the School Committees, either at school or in their consultation rooms. On the whole, an average of 2,254 children were either examined or "observed" by each doctor. Of a total of 24,225 children under observation in 1904-5, 1,125 suffered from tuberculosis; and the school doctors' joint report says: "Most of the children in the incipient stages of tuberculosis attend school without either parent or teacher having any suspicion that they are anything."

So, too, in 1904-5 the general constitution of the children newly admitted to the elementary schools of Wiesbaden was "good" in only 41.2 per cent. of the cases, "medium" in 54.4 per cent., and "bad" in 4.4 per cent.

Of 1,043 children presented for examination, 549, or 52.6 per cent., were found to be suffering from 813 maladies.

It is noticeable also that a comparison of the health of the children admitted to the elementary

and middle schools respectively of Wiesbaden is much to the advantage of the latter. The "general constitution" of these children was found to be as follows:—

	Elementary Schools.		
	Good.	Medium.	Bad.
1903-4	38.7	55.7	5.3 per cent.
1904-5	41.2	54.4	4.4 "
	Middle Schools.		
	Good.	Medium.	Bad.
1903-4	46.4	51.2	2.4 "
1904-5	41.7	57.5	0.8 "

Other recent returns of health in German elementary schools similarly attest the need for this medical supervision:—

	Good.	Medium.	Bad.
Frankfort (1902)-	36.9	57.2	5.9 per cent.
Breslau (1902) -	45.4	48.0	6.7 "
Chemnitz (1902-3) -	25.4	69.1	5.5 "
Mülhausen -	43.3	30.8	25.8 "

Equally instructive are the results of the re-examinations.

Those made at Wiesbaden in 1904 showed decided improvement in health in the upper classes both of the elementary and middle schools. Thus the former:—

	Good.	Medium.	Bad.
Class 8 -	41.2	54.4	4.4
" 6 -	40.7	54.8	4.5
" 4 -	41.0	54.3	4.7
" 1 -	49.5	48.1	2.4

An analysis of the examinations made at Mülhausen (Alsace) during a series of years shows the same improvement, though the absolute figures may not appear very encouraging, and it will be noticed that in the case of girls the improvement is shown by a higher all-round average of health. Taking the children falling to each of the seven school years, the percentages of strong, medium, and weak constitutions were as follows:—

	Boys.		
	Strong.	Medium.	Weak.
1st Year -	46.7	28.9	24.3
2nd " -	45.6	30.9	23.4
3rd " -	39.9	38.1	21.9
4th " -	33.3	40.0	26.6
5th " -	39.5	45.1	15.3
6th " -	58.0	25.2	16.7
7th " -	53.8	41.0	5.1
	Girls.		
	Strong.	Medium.	Weak.
1st. Year -	39.9	32.7	27.2
2nd " -	35.2	36.0	28.8
3rd " -	34.7	35.9	29.3
4th " -	29.3	50.0	20.7
5th " -	20.6	59.3	14.0
6th " -	28.9	57.2	13.9
7th " -	19.0	76.0	4.9

THE TREATMENT OF DEFECTIVE CHILDREN.

The result of every individual examination is notified both to the teacher and the parents of the child. The teacher is told the measures which are

needful on his part in the interest of the child's health. The directions to the parents are given more deliberately, generally in writing and through the mediation of the school authority.

It will be asked, however, what occurs when the advice is not followed? It is obviously in the interest as much of the school as of the scholar that the recommendations made by the school doctors should be carried out, and many school authorities adopt such precautions against parental negligence as are practicable without resort to coercion. The usual plan is for the school doctor to follow his advice at a reasonable interval by inquiry as to what has been done. If nothing, he may repeat his recommendations more urgently, or the school authority may do so instead.

Thus the Hagen regulations provide:—

"The school doctors have to convince themselves by a second visit within about fourteen days that the directions which they gave as to medical treatment have been followed. Should this not be the case, and should intervention be urgently necessary in the interest of the child or of the school, the Chief Mayor shall be acquainted with the fact. Similar notification shall be made where children need special care and the parents are not in a position to give it."

Another regulation runs:—

"When in spite of repeated warning the medical treatment of a child is neglected, the Mayor may be requested to propose treatment in the Municipal Hospital."

Nevertheless, a warning of this kind is but a *brutum fulmen* since the Mayor himself, though he can admonish, cannot compel. It is therefore satisfactory to know that such measures of suasion are seldom necessary. Thus it was found at Leipzig that in 75 per cent. of the cases in which advice was given to parents, remedial measures were at once taken; on a supplementary examination the majority of the remaining parents followed the advice given, and only in a very few cases—less than 4 per cent. of the whole—were the school doctor's efforts entirely thrown away. Again, the report on the work of the Berlin school doctors during the year 1904-5 states that "the advice tendered was as a rule received with gratitude and for the most part faithfully followed. The children themselves attended to the directions given, and indeed listened more eagerly than their parents." Not only so, but the same willingness is shown to wait on the school doctor for consultation when invited.

It has been found, however, that where the doctor's directions are not followed, lack of time or of means is frequently the cause. Hence where the parents of a child needing special medical treatment are in receipt of poor relief, it is not unusual to hand the case over to the Poor Law doctor or to the authority which controls that officer. Some advocates of medical inspection of schools have even suggested that the whole of this work might be entrusted to the Poor Law doctors where convenient, though the idea is strongly opposed by most school authorities and educationists.

In some places special forms of notification are

used for acute and infectious diseases, and especially in the case of verminous uncleanness, for which a detailed course of treatment is prescribed. As regards the last, drastic measures are resorted to—for the law allows it—where parents persist in neglect. Thus in Wiesbaden, Frankfurt, and elsewhere, the police authority, on the request of the school committee, conveys the defective child to hospital for treatment where repeated warnings to the parents have been disregarded.

THE DURATION OF EXAMINATIONS.

An important point which bears intimately upon the question of the number of school doctors required for the schools of any particular town or district and the cost of their services is the time required by these medical examinations. Experience has shown that in practice a class of from forty to forty-five children can be examined in an hour and a half, which means two minutes a child. Writing on the methods followed at Leipzig a school doctor there says:—

"The examination is made with all desirable exactitude in the time given (an hour and a half for forty to forty-five children). The time taken may at first be somewhat longer, but a doctor soon gets into his work. Nor is there any fear of serious maladies being overlooked, particularly when the work is done systematically, and when—as is very desirable—a child's mother is present at the examination."

According to another authority, "from seven to nine minutes per child, though at times less," is needed where a number of newly admitted children are examined at once.

On the other hand, the theorists have contended that at least half-an-hour should be devoted to every child if the results are to have proper value, and in any case that a little extra time bestowed on a first examination cannot be regarded as wasted, since the risk of error in diagnosis and the need for later corrections and modifications will thereby be minimised.

Yet it should be remembered that the purpose of a school medical examination is hygienic and not therapeutic; it is not the treatment of disease but its detection, with a view simply to (1) determining whether school life would be injurious or not, and (2) where a defective child is allowed to enter school deciding what modification of the ordinary curriculum should be applied in its case. Hence the exact knowledge of a child's condition which would be essential, for an attending physician is not necessary for an examining school doctor.

What the school doctor does is to detect and record defects where they exist, and to advise remedial action in general terms; what follows is the business of the practitioner who may be consulted.

HEALTH LECTURES FOR TEACHERS AND PARENTS.

Besides their strictly supervisory work, many school doctors give instruction in hygiene. In Hungary, where school doctors are appointed for the higher schools only, such instruction is regularly given to the scholars. In Germany the same thing is done on a small scale, though opinions

differ as to the expediency of so employing the school doctor, especially as he would cover ground which in some form has been recognised as falling to the ordinary teacher's province. The medical faculty contend that capacity to give instruction pre-supposes greater qualifications than now belong to the average teacher, but that contention would seem to point only to the advisability of the school doctors equipping the teachers for the task, and not to the necessity of superseding them. Already, indeed, in a few towns it is usual for the doctors to give periodical lectures to teachers on hygienic questions, from the standpoint of education, either at meetings of the Teachers' Associations or at special conferences called for the purpose.

In Berlin there is a notable variation of this usage. There, mixed gatherings of teachers and parents are occasionally held during the winter, at which health questions among others are discussed after lectures or papers by school doctors. In the larger towns the school doctors hold conferences amongst themselves, and in some places (as Wiesbaden) the District Medical Officer is invited to be present.

THE QUESTION OF COST.

In the payment of the school doctors three modes are adopted in Germany—(1) a fixed stipend, (2) payment according to work done, and (3) a combination of these methods, that is, to a fixed stipend a "supplement" is added for services of a special kind. As a rule the remuneration is broadly proportionate to the number of classes attended, though the basis of calculation is widely different in various towns. In the majority of towns the payment ranges between 10 and 25 marks per class the year, but at the two ends of the scale are rates as low as 5, 4, and 3 marks per class and rates as high as 33 marks and in one case 66 marks. As a rule a class contains 50 children. Mannheim, in the Grand Duchy of Baden, is alone in employing a single school doctor who devotes the whole of his time to the work and is a fully qualified municipal official. He receives 10,000 marks (£500) a year. The measure of payment can be most usefully shown by a number of illustrations, taken independently of the basis of calculation from towns of different populations (census of 1905 where known):—

Town.	Population.	Yearly Salary.	Average number of Classes.	Average payment per Class.
Berlin (1905)	2,034,000	£100	127	15s.-16s.
Bielefeld (1900)	63,046	£20	26	18s.
Bonn (1900)-	50,736	£37. 5s.	31	£1 4s.
Cassel (1905)	120,000	£40	44	18s.
Cologne (1905)	425,000	£10-£22 10s.	17-36	12s.
Dresden (1905)	514,000	£25-30	115-198	3s.-4s.
Halle (1905)	169,000	£30	9	£3 6s.
Frankfort-on-Main (1905)	336,000	£50	32	£1 11s.
Nuremberg (1905)	293,000	£25-30	40	13s.
Strassburg (1905)	167,000	£50	40	£1 5s.
Wiesbaden (1905)	100,000	£30	25	£1 4s.
Darmstadt (1900)	72,381	£37 10s.	35	£1 2s.
Erfurt (1900)	85,202	£10-£23	16-29	13s.-16s.

Town.	Population.	Yearly Salary.	Average number of Classes.	Average payment per Class.
Giessen (1900)	25,457	£50	70	14s.
Gottingen (1900)	30,234	£40	38	£1 1s.
Ratisbon (1900)	25,250	£25	26	£1
Treves (1900)	43,506	£20	27	15s.
Worms (1900)	40,705	£25	35	14s.
Apolda (1900)	20,364	£20	30	13s.

A school doctor is engaged under a definite contract of service, in which his duties are clearly set forth. The only restriction imposed upon him as a practitioner is that he is not allowed to attend the children who come before him for examination. He is not, however, given the position of a municipal official in the sense of the German State laws regarding communal officials; in other words, he discharges only delegated duties, and he has no claim to pension.

PROGRESS OF THE SCHOOL DOCTOR MOVEMENT IN GERMANY.

The institution of the school doctor has not yet been universally introduced in Germany, yet in some parts of the country it has been adopted so generally that it may be said to form an essential part of the system of public education. Naturally the large towns, with their ample financial resources and their larger ideas of educational efficiency, have been more progressive than the smaller places and the rural districts, and yet some of the latter have shown a laudable enterprise.

The institution is in operation in different forms and with varying degrees of thoroughness, and in reviewing the extent to which the school doctor has been naturalised in Germany it is fair to take cognizance of every species of genuine medical inspection.

(1) There is the simple sanitary inspection (as a rule twice a year) of the school buildings—a function which represents the school doctor in the most rudimentary and least adequate form. Here the purpose is merely sanitary, and does not embrace the personal oversight of the children.

(2) To the duty of school inspection this oversight of the children is added, yet only in special cases on the request of the head teacher.

(3) The third form is school inspection combined with the medical examination of all newly registered children—i.e., examination once only.

(4) Here school inspection, from the standpoint of hygiene, is combined with the examination of all children at regular intervals. This is the Wiesbaden system, and it represents the institution of the school in its most developed, yet, even so, perhaps not final, form.

At the present time, not far short of 600 school doctors of all kinds are at work in Germany. Twenty-one of the thirty-three "large" towns (those with 100,000 inhabitants) have adopted the system, and of 229 "large" and "medium" towns (the latter being towns with a population of over 20,000) 106 have school doctors of one sort or another, and 123 are without.* Several towns of

* Census of 1900.

only 3,000 inhabitants have followed suit, and here and there rural school doctors have been appointed for areas covering adjacent parishes. Most significant of all is the fact that where the movement once takes root its growth is continuous and rapid.

Berlin began with ten school doctors in 1900, two schools being allotted to each doctor, and so satisfactory were the results that the number was increased in 1903 to thirty-six—two of the doctors being given nine schools each, twenty-three being given eight schools each, eleven being given seven schools each.† In that way the 223,297 children under the school authority were divided in the proportion of 6,200, or 127 classes, to each doctor. The number of classes to each doctor in other large towns of Germany varies: thus—Hanover 12, Magdeburg 18, Wiesbaden 25, Aix-la-Chapelle 30, Frankfurt-on-Main 32, Charlottenburg 36, Breslau 40, Cassel 44, and Königsberg 50.

Nevertheless, taking Germany generally, the number of school doctors in practice is still relatively small to the population. The ratio is highest in the Duchy of Meiningen, viz., one to every 6,965 inhabitants; in the Prussian Province of Brandenburg it is one to 37,909 inhabitants; in the Province of Hanover, in the same kingdom, it is only one to 432,030.

There can be little doubt, however, that the practice of systematic medical supervision will in course of time be extended to the entire system of schools. To this end the teaching profession and the medical profession are working heartily hand in hand, supported by that large and zealous band of lay educationists whose enlightened efforts on the managing authorities of town and country alike have done so much to earn for Germany the proud distinction of being a "land of schools." Here, too, in the growing care for the physical welfare of the young, is followed the principle which was enunciated three-quarters of a century ago by one of the inspirers of modern German educational ideals (J. Wagner), "The condition of a nation's schools is the measure of its civilisation."

The pamphlet contains a valuable bibliography of German works on school hygiene, and an appendix is given which consists of translations of Report Forms, Regulations, etc., used in the work of school hygiene in various towns in Germany.

ADDRESS TO BERLIN MOTHERS ON THE USE OF ALCOHOL.—The Berlin School Department, through its school doctors, places the following address in the hands of the parents of every newly registered child:—

"Mothers! Give your children no alcoholic drinks. In the opinion of all doctors even the moderate use of alcohol is injurious to children

† The Berlin municipal estimates for the year 1905-6 provide for eight additional school doctors.

under fourteen years. Children should receive neither beer nor wine, still less spirit, liqueur, or cognac—even in small quantities. The alcohol contained in all these beverages is a poison; beer contains from 2 to 6 per cent.; wine 6 to 20 per cent.; spirit from 30 to 70 per cent. of alcohol. Whoever drinks a litre of beer consumes as much alcohol as the one who drinks an eighth of a litre of spirit.

"Alcohol acts as a temporary stimulant, but weariness and languor, both of mind and body, succeed. Whoever has drunk alcoholic beverages is less attentive (and so more exposed to accident), is indisposed to and incapable of mental and bodily work (resulting, for example, in bad reports at school, and later, loss of situations, and loses self-control (causing tendency to crime).

"The habitual drinker injures his body (particularly the heart, the liver, the kidneys, and the stomach), he is more disposed to illness and as a rule he dies prematurely. In febrile diseases, like inflammation of the lungs, the drinkers have less power of resistance (most of them succumb), while those who are not used to the drinking of beer, wine, or spirit have a better prospect of recovery.

"Habitual drinking also easily leads to excess, and the immoderate drinker brings unhappiness to himself and his family, whether he loses his position and livelihood and becomes a beggar, or finds his way into prison (and more than half the crimes and offences committed have their origin in the abuse of alcohol), or becomes a suicide. In the Friedrichsheim Hospital in Berlin 208 persons (or 7 per cent. of all admissions) were admitted during one year suffering from dipsomania. At the present time some 12,000 persons similarly afflicted are to be found in the lunatic asylums and hospitals of Germany. From a third to a half of all the inmates of the asylums owe their misfortune either to their own drunkenness, or to that of their parents and ancestors.

"The nutritive property of alcoholic drinks is extremely small. The money spent on these drinks would purchase a much larger quantity of good food—milk, bread, meat, etc. Judged by its nutritive value beer is ten times as expensive as brown bread.

"If you are concerned for your children's welfare, give them no alcoholic drinks, which injure the physical and mental development of children, which promote insubordination, which make children excitable and nervous, and endanger morality. Give them instead, water, sugar water, milk, cocoa, and fruit.

"Our teachers often notice that scholars are less attentive and show more weariness and unwillingness to learn on Monday than on other days of the week, also that on that day they either attend late or remain away altogether. Inquiries have brought the reason to light; these are the children who are given alcoholic drinks on Sunday and who do not go early to bed. To allow children to pass Sunday in the open air is good for them; but this benefit should not be at once neutralised by harm. Sunday pleasures should be of such a kind that children may not as a result suffer bodily and mental injury."

THE WORK OF THE SCHOOL DENTIST.

AT a recent meeting of the School Dentists' Society three interesting papers were read on the following subjects:—"The State and School Children's Teeth," by Mr. John Oliver, Hon. Dental Surgeon to the Cardiff Infirmary; "Fifteen Years' Work Amongst Poor Law Children," by Mr. Edward Keen, Dental Surgeon to the Training Ship "Exmouth," &c.; and "The Education (Administrative Provisions) Act and Dentistry," by Mr. T. W. Elliott.

Mr. Oliver urged the importance of State interference in the matter of school children's teeth:—

In these days there is abundant evidence of the deterioration of teeth as compared with those of the early inhabitants of these islands. Out of thirty skulls recently discovered in the Valley of Glamorgan, decay was only found in three; while quite recently, in a school of one hundred in the same county, not a single boy was found to have a healthy set of teeth. In my own examination of a school of fifty-four girls, only one had perfectly sound teeth.

The effect civilisation has had upon teeth has reacted upon the people of the present day in producing a number of maladies which are fostered and encouraged by diseased teeth.

But the poorer classes in this country are mostly ignorant, steeped in prejudice, and improvident, neither have they money to spare to provide skilled attention for their children's teeth; hence it seems vain to suppose that any system of popular education will ever be voluntarily acted on by the masses. To-day, while the benefits of dental attention are largely known and acknowledged by the middle and wealthier classes, probably not one in a thousand of the working-classes ever spends a shilling on the preservation of his own or his children's teeth.

In my opinion, therefore, any system of dealing with the teeth of the nation must be compulsory and not optional, otherwise it will be in danger of being frustrated by the prejudice of the parents and the unwillingness of the children.

Mr. Keen, in the course of his paper, said that when he was appointed to the training ship "Exmouth," nearly fifteen years ago, he was told by the late captain that

It was no uncommon sight to see boys lying about the decks holding their faces, agonized with pain, their only relief being afforded by the homely applications of the captain's daughter until such time as the doctor should come and give the *coup de grace*. After I had been at work some little time all this was altered, and it became a rare thing to meet a boy with toothache. This was due to a course of regular inspection. We began with twice a year, now we

have increased the number to three times a year. In this way I find not only the large patent cavities with exposed pulps that are so frequently the seat of abscess, but I am able to discover the commencement of disease, and by appropriate treatment, am able to save hundreds of teeth that otherwise would have been sacrificed, and this is where I consider I have been able to do most good.

To describe my method of inspection I must first explain that the complement of the ship's company is 600 boys who are divided into six divisions of 100 boys each, each division being divided into two watches, port and starboard. I visit the ship or infirmary every Tuesday, and on the first Tuesday of the first month I inspect, say, the 1st Division of the Starboard Watch, and all the new boys who have joined the ship since my last visit. If there are not many of these, I may perhaps inspect the 2nd Division of the same Watch, making, perhaps, eighty or ninety boys inspected. Their names are all entered in a book by the master-at-arms, and, when new boys, I enter against their names what should be done in their mouths. If old boys, I tick them off as seen and enter anything fresh that should be done, at the same time making a note of their numbers, so that in turn they may be sent over to the infirmary to be operated on. Every Tuesday afternoon a batch of boys selected by myself is sent over to the infirmary for that purpose. I generally send for eight or twelve boys in a batch. On the second Tuesday morning I see the 1st Division of the Port Watch and any new boys. In this way every boy is inspected once in four months in addition to his inspection as a new boy.

With regard to extractions, it is not my practice to extract all teeth that are too much decayed to be stopped, only those that are, I think, liable to be the seat of mischief.

Of course, one's great trouble is to persuade children to clean their teeth. I have more trouble from this cause than any other. The collection of tartar round the roots of the teeth causes the gums to become thick and turgid, and sometimes even the seat of pyorrhea. The same, of course, applies to the Kensington and Chelsea Cottage Home School at Banstead, only the method of inspection differs. There the 700 children are divided into cottages. The boys' cottages contain forty, and the girls' twenty-five, the former being in charge of a married couple who are called the father and mother, and the latter of only a mother.

I visit here every Saturday afternoon and inspect one boys' cottage or two girls', who are sent up to a room provided for me for the purpose, and as I see them I note anything to be done and the patient stays behind to be operated on after the inspection is finished. The children here are taken in batches of about seventeen at a time and kept in a probation ward for a fortnight, and I devote a whole afternoon to the attention of each batch whilst in ward.

I am often exercised in my mind as to how much filling of temporary teeth should be done, but must admit to not doing much, perhaps not as much as one ought. Of course, all instruments and materials are provided by the institution.

Mr. Elliott, in his paper on "The Education (Administrative Provisions) Act and Dentistry," gave the following statistics as to defective dentition in school children:—

Of 70,000 children in Leeds, 75 per cent. have bad teeth.

Ninety-six per cent. of the children attending council schools in Kettering have defective mouths. (Mr. A. Layton in a paper read at Cardiff, May, 1907).

Of 10,517 boys and girls of the average age of twelve years in English and Scotch schools, only 14.2 per cent. have complete sets of teeth free from decay; 85.8 per cent. having defective teeth. (Mr. W. Cass Grayston in a paper read at Cardiff, May, 1907).

Boys and girls attending elementary schools of Brighton:—

7,326 examined.

23.2 per cent. having sound teeth.

76.8 " " " carious " (from the report of the Medical Officer of Health for Brighton).

Germany.—Dr. Jessen (of Strasburg) says that out of 4,000 children 2.5 per cent. have sound teeth; 97.5 per cent. have defective dentition.

Russia.—Mons. Gabronsky, at the International Congress on School Hygiene, revealed the fact that 95 per cent. of all school children possessed carious teeth.

America.—Children with teeth affected, 93 per cent.

Italy.—92 per cent. with affected teeth.

Switzerland.—90 to 100 per cent.

In Norway, Sweden, Denmark, Hungary, and other States the figures are very similar.

In New Zealand, 85 per cent. require treatment, and there, I believe, they have under consideration some scheme similar to the one we are now organizing.

As to dental treatment, Mr. Elliott thought it might be carried out in three ways:—

First, by a properly equipped surgery at each school, or at convenient centres where duly appointed dentists would attend. This would be effective, but very costly.

Secondly, at hospitals, but here all cases could not be treated by hon. officers unless the Institutions were reorganised; nor did he think it desirable, to have Hospital Departments properly equipped where men give their whole time to the work, because this course would not solve the difficulties of area and distance in a large number of cases. The Public Health Act of 1875 gives power to authorities to establish hospitals, and its provisions could be put in force, he presumed for the purpose of this Act.

Thirdly, at the offices of private practitioners.

With regard to the second point, he thought that this method would be extremely undesirable as matters stand, inasmuch as it would tend ultimately largely to do away with and abolish private practice.

The third method—treatment by local appointed dentists—seems the most desirable from several

points of view, and if young practitioners were appointed who were prepared to give sufficient time to the work, at a fixed scale of fees for a certain schedule of requirements drawn up by the Education Authorities, and fixed as in the case of Poor Law Administration, it would be the most desirable course.

The following scale of fees was suggested by Mr. Elliott:—

- | | | | |
|------------------|-----|-----|----------|
| A. For 1 filling | ... | ... | 2s. 6d. |
| " 5 fillings | ... | ... | 10s. 6d. |
| " 10 " | ... | ... | 15s. 0d. |

This sliding scale would include any filling that it might be deemed best to use.

- | | | | |
|------------------------------------|-----|------|----------|
| B. Necessary extractions for regu- | ... | ... | 5s. 0d. |
| lating | ... | ... | |
| Regulating plates | ... | each | 10s. 0d. |
| Attendance and necessary altera- | ... | ... | 15s. 0d. |
| tion when required | ... | ... | |

- | | | | |
|---------------------|-----|-----------|---------|
| C. Extractions | ... | each | 1s. 0d. |
| " by injection | ... | ... | 2s. 6d. |
| " c. nitrous oxide, | ... | each case | 5s. 0d. |

(No limit to number of teeth removed.)

- | | | | |
|-----------------------------------|-----|-----|---------|
| D. Minor operations for obtaining | ... | ... | 2s. 6d. |
| hygienic conditions, such as | ... | ... | |
| scaling, removing of pulpless | ... | ... | |
| deciduous teeth, obtunding | ... | ... | |
| dentine, stomatitis, and other | ... | ... | |
| work not included in the | ... | ... | |
| above | ... | ... | |

THE SCHOOL DOCTOR'S POSITION IN GERMANY.—Under the title of the "School Doctor Question," a lively correspondence has recently been agitating the public press in Germany. The essential similarity of the problems in that country to those in our own is shown by the remarks of a writer in the *Wormser Zeitung*. Indeed, we can have no doubt that, once medical inspection is in working order, the questions he raises will be burning ones here, as they already are in Germany. He points out that in the towns and districts in Germany in which part-time medical officers (in general practice) have alone been appointed compare very unfavourably with those where whole-time school doctors have been at work. In many of the former, after four years of work, all the schools have not been once thoroughly examined, or the scholars provided with the health card which is the necessary preliminary to ameliorative treatment. Of the value of medical inspection there is no doubt; of the necessity of treatment following no doubt either. This leads him to discuss treatment. Who is to perform it? and who is to pay the doctors? To these inquiries he gives no answer, but points out that two important considerations must be borne in mind: First, the responsibility of the parent must not be undermined; and secondly, the father of a child should not lose his civil rights if the case has to be treated under the poor law. But, according to this writer, one thing seems to be clear: the general practitioner as part-time officer in Germany is doomed.

REVIEWS.

THE BACTERIOLOGY OF DIPHTHERIA. Edited by Professor Nuttall and Dr. Graham-Smith. Cambridge University Press. 25s.

This handsome volume is a veritable encyclopædia of diphtheria, and we may say at once that it should find a place in the library of every medical officer of health. The subject matter is arranged in six sections, each of which is written with authority and distinction. The history, epidemiology, and pathology of diphtheria are dealt with respectively by Professor Loeffler, Dr. Newsholme, and Professor Mallory; Dr. Graham-Smith contributes a section of ten chapters on the bacteriology of the disease, the modes of infection in man, and preventive measures; Dr. Dean discusses immunity and anti-toxin, and the concluding section on diphtheria mortality and serum sickness is by Professor Park and Dr. Bolduan. The book, which is edited by Professor Nuttall and Dr. Graham-Smith, contains biographies, with portraits, of the four great men of diphtheria—Bretonneau, Loeffler, Von Behring and Roux. There is a full bibliography, and the needs of the busy student have been considered by the provision of a labour-saving index. The present volume, though a vast storehouse of facts, is no mere work of reference. The information is presented in an attractive form, and the book is one which it is a pleasure to read. It is an ungracious task to suggest amendments in a work of such high scientific merit, but we cannot help pointing out that a special section might with advantage have been devoted to the administrative control of diphtheria, and that the editors would have done well to have drawn more freely upon the services of health officers engaged in the actual work of administration.

HYGIENE AND PUBLIC HEALTH. By Dr. B. Arthur Whitelegge and Dr. George Newman. Cassell & Co. New and revised edition (1908), 7s. 6d.

Whitelegge's "Hygiene and Public Health" is a book that has enabled many a medical officer of health to surmount, not only the difficulties that attend the conquest of the D.P.H., but also the much more serious difficulties that arise in the practical work of public health administration; and the appearance of the book in an eleventh edition is conclusive proof of its continued usefulness. There is nothing surprising in the popularity of this excellent text-book. Although small enough to be carried comfortably in the pocket, it contains a surprising amount of information, which is set out in a style, the clearness and conciseness of which must compel the admiration of all who have endeavoured to expound public health subjects within a limited space. The present edition, which, like the last, has been prepared with the assistance of Dr. George Newman, has been brought well up—or, as the writers prefer to say—down to date, and it will be found most serviceable, both by the student and the practical health officer.

CHILD LIFE AND LABOUR. By Margaret Alden, M.D. London: Headley Bros. 1s.

Recent developments in public health work, especially those relating to school hygiene and to the prevention of infantile mortality, have brought medical officers of health into closer touch with the many important questions affecting the welfare of children. It is most probable that this tendency will gain in strength as time goes on, and that the future will add to the responsibilities of the health officer in relation to the child. Medical officers of health have, therefore, a special interest in the subject matter of Dr. Margaret Alden's admirable little book, which discusses very clearly the various methods by which the modern State seek to safeguard the child. The book contains chapters on such matters as infant mortality, the medical inspection and the feeding of school children, child labour, State children and juvenile offenders. The principles of State interference in relation to children are very fairly considered, and a copious bibliography is appended. There is a curious slip on page 125, where two of Mr. Kipling's lines are ascribed to William Morris; but, poetry apart, Dr. Alden has evidently taken considerable pains to verify her information, and she has succeeded in making her book a trustworthy statement of fact.

APPOINTMENTS.

DR. W. J. HOWARTH (Derby) has been appointed County Medical Officer for Kent.

DR. R. A. LYSTER has been appointed County Medical Officer for Hampshire.

A. MAXWELL WILLIAMSON, M.D., B.Sc., has been appointed Medical Officer of Health of the city of Edinburgh.

DR. W. J. BETHUNE has been appointed Medical Officer of Health to the Bideford Rural District Council.

DR. E. W. TUXFORD has been appointed Medical Officer of Health to the Wheathurst Rural District Council.

DR. ISOBEL TATE, Resident Medical Officer at Burnley Workhouse, has been appointed Medical Officer of School Children for Shropshire at a salary of £250 per annum, rising to £300.

DR. J. J. BUTTERWORTH, Medical Superintendent of Schools at Salford, has been appointed by the Lancashire Education Committee to the position of Schools' Medical Superintendent for the administrative county.

The President of the Board of Education has appointed Miss JANET M. CAMPBELL, M.D., to the Medical Department of the Board.

GEORGE IRVINE THOMPSON STEWART, M.B., C.M. (Aberd., F.R.C.S. Eng.), has been appointed Medical Inspector of School Children to the East Suffolk County Education Committee.

FRANK B. SKERRETT, M.B., Lond., D.P.H., has been appointed School Medical Inspector for the County Borough of West Ham.

DR. CHARLES MURRAY is recommended for appointment as Schools' Medical Officer to the Preston Corporation at a salary of £250 per annum.

NOTES ON THE MIDWIVES' ACT.

A PIONEER in State midwifery is lost by the death of Charles James Cullingworth. Like many pioneers, he specialised only late in life, and having once specialised, he drew up for himself a broad conception of his speciality and confined his energies to its limits. A taste of commercial life, a year or two in country practise, ten years as police-surgeon, seven as a lecturer on Medical Jurisprudence, administrative work for the Victoria University, and in all twenty years in Manchester before his call to London at the age of forty-seven, combined to distinguish him from most of his colleagues, and to prepare him for the larger interests of his work. Long associated with the Obstetrical Society and its Board for the examination of midwives, his presidential address in 1897 on the undiminished mortality from puerperal fever gave public prominence to his advocacy of State midwifery; he was a careful and zealous member of the Midwives' Registration Association from 1893, and of the Midwives' Bill Committee from 1895; and when the Midwives' Act was passed he was the first representative of the Midwives' Institute on the Central Midwives' Board, and chairman of the executive of the Association at Dacre House for promoting the training and supply of midwives.

Reports of the work for the year 1907-8 of the Central Midwives' Board, now in its sixth year, show its usefulness, both in supervision and in the promotion of amendments. The Privy Council were requested (1) to secure detailed amendment of the 1902 Act; (2) to secure recognition of midwives in the notification of Births Bill; (3) to provide for the recompense of medical practitioners called in under the Rules of the Board; (4) to consider means for the training and supply of midwives, especially in rural districts; (5) to allow a midwife to describe herself, if so, as certified by examination, although by the rules no other abbreviation or description of her qualification is allowed. Co-operation with the coroners has been assured through the Home Office, which will distribute copies of the Midwives' Roll to Coroners, and have directed that Coroners shall report convictions of midwives at once to the Central Midwives' Board. The Local Government Board have been asked for a return as to the adoption by Guardians of rules for the payment of medical practitioners called in under the Rules of the Central Midwives' Board. The circular sent to Guardians on this subject has been also sent to medical practitioners. A second edition of the report, entitled, "Particulars of Administration of the Midwives' Act," now two years old, is being compiled. Six examinations were held by the Board during the year in London, three each in Bristol, Manchester and Newcastle, one in Birmingham; 1,638 midwives were added to the roll, of whom only 54 per cent. intend to practise as such; 84 names have been removed by the Board, 21 midwives censured, and 21 cautioned. Of these 114 women, only 6 held certificates of training.

There are now some 25,000 names of midwives on the Roll, of whom about one-half notified intention to practise in 1908—10,000 in counties and 2,890 in county boroughs. The Roll, however, is necessarily imperfect, especially with regard to change of address and removal by death. A form is now issued by the Board by which midwives may voluntarily withdraw their names; and 61 have thus retired during the year.

There are sixty-two administrative counties and seventy-three county boroughs, but Dorset, Isle of Wight, Kent, Lincoln (Kesteven), Anglesey, Brecon, Carmarthen and Pembroke counties have delegated their duties under the Midwives' Act to minor authorities, and there are, therefore, 285 local supervising authorities in England and Wales. Some of these, however, have repudiated the delegation of these duties, which are, therefore, not being carried out. Except for Uffington Rural District Council, all these instances are in Wales.

At the last examination of the Central Midwives' Board, 234 candidates passed out of 298, giving the percentage of failures as 21.5.

In last month's issue we considered the supply of midwives. An important letter on this subject has been addressed to chairmen of county councils by Lord Goschen for the Queen's Jubilee Institute, Mrs. Wallace Bruce for the Association for Promoting Training and Supply, Mrs. Heywood Johnstone for the Rural Midwives' Association, Miss Gregory for the Woolwich Home for Mothers and Babies, and Miss Wilson for the Midwives' Institute. The letter is noticeable in the first place in that it only points out the facts of the case, urging the councils to consider the formation of centralizing bodies in each county, and the advisability of requiring authority for a grant from the rates or from the Exchequer; in the second, in that it shows a desire of the principal voluntary association to take concerted action. Co-operation between these bodies, each with considerable influence amongst the higher powers, is an essential to parliamentary action in the case. A speech, therefore, made by Mrs. Hobhouse, now elected chairman of the Rural Midwives' Association, at the recent annual meeting of that body at Lady Esther Smith's house in Grosvenor Place, is all the more welcome, in that it defined a clear plan of campaign, by which representatives of each of the above bodies are to meet under her chairmanship to consider the steps to be taken for procuring aid from public monies for the supply and training of midwives. It will be remembered that, at present, local supervising authorities, under the Midwives' Act, have no power to spend money for this purpose; and that county councils can only give a grant out of their fund for higher education, a fund on which there are many more strictly educational claims.

The resignation by Mrs. Heywood Johnstone of the chairmanship of committee of the Rural Midwives' Association, in which she is succeeded by Mrs. Hobhouse, wife of an Under-Secretary of State, gives occasion for a brief acknowledgment of the large knowledge and great pains exerted by

her and her late husband, Member of Parliament for East Sussex, in the steps which led up to the passing of the Midwives' Act, and since 1902 in the foundation by her, and for five years in her leadership as chairman of committee of this useful body. Mrs. Heywood Johnstone's pamphlet on the existing organisation and supply of midwives in 1907 is a valuable contribution to a knowledge of the subject; and the Memorial Home in Bermondsey to her husband is an active and efficient institution for the training of district midwives. In recognition of her work, Mrs. Johnstone has been elected president of the Association.

The Annual Report of the Rural Midwives' Association shows that 349 applications were received during the year from candidates for training, and 50 applications from local associations and individuals for trained midwives; 55 women were sent for training and 53 sent up for examination, of whom 43 passed; 191 women have thus been trained in five years, of whom 125 are now working in twenty-two different counties; 24 have retired after completion of their three years' service; 24 have left or been dismissed; 18 were still training.

In an interesting study of overlaying by Mrs. Greenwood, certified midwife and sanitary inspector in Finsbury, in the June number of *Nursing Notes*, it is shown that 108 infants met their death in this way during the last four years. Their ages at death are significant, viz., in the first four weeks, 9, 2, 8, 0, making 19 in the first month; and in the following months respectively, 27, 18, 12, 11, 2, 2, 0, 1, 0, 1, 1. Six out of the nine that died in their first week were suffocated at birth. Excluding these, thirty-eight were suffocated in the months from April to September, fifty from October to March. In considering the causes, stress is laid on the fact that overlaying on Saturday night is often due not to drunkenness but to fatigue, Saturday being an exceptionally hard day for the working-class mother. Infant-insurance is not considered to play any important part. It is noticed that, as compared with other causes of death, death from overlaying, after excluding death at birth, is comparatively rare during the puerperium; that many overlaid babies are naturally weakly; and that cases frequently occur after the mother has had an exceptionally fatiguing day. It is suggested that post-mortem examination should always be performed; that many cases are due to the fatal habit of letting the infant sleep on its mother's arm in bed, often with the nipple in its mouth; and that the chief difficulty is one of poverty and warmth, and cannot be met by the provision of cots and cradles in the houses of the very poor. The importance of well-instructed midwives and health-visitors is thus emphasised. A correspondence between the Home Office and Mr. Murray, the eminent philologist, shows that the proper word for use in this connection is the verb *overlay* (*overlaid*), derived from the transitive verb to lay, and not the verb *overlie* (*overlaid*), derived from the intransitive verb to lie.

OBITUARY.

JOHN JAMES RIDGE, M.D., M.D. (State Medicine), B.A., B.S., B.Sc. Lond., M.R.C.S., L.R.C.P.

We regret to announce the death of Dr. John James Ridge, which took place on May 25th. Dr. Ridge was Medical Officer of Health of the Enfield Urban District, and Medical Superintendent of the Enfield and Edmonton Joint Isolation Hospital. He received his professional training at St. Thomas's Hospital, which he entered in 1864, and in 1868 he took the degrees M.B., B.S., in the University of London, being awarded the University scholarship and gold medal in surgery. In 1869 he graduated M.D., and in 1891 M.D. in State Medicine. After holding the post of house surgeon at St. Thomas's Hospital, Dr. Ridge went into private practice first at Clapham, and subsequently at Enfield, where he afterwards became medical officer of health.

Dr. Ridge was, as is well known, a prominent and enthusiastic worker in the temperance movement. With Sir G. Burrows, Dr. Jas. Edmunds, and the late Sir B. W. Richardson, he was one of the founders of the British Medical Temperance Association, of which he was secretary up to within a short time of his death. Dr. Ridge was for twenty-five years physician to the London Temperance Hospital, and had much to do with the development of the work of that institution. He was a frequent contributor to the literature of the temperance movement, and was for some years editor of the *British Temperance Medical Review*. Dr. Ridge was well known in temperance circles abroad, and he was elected president of the New International Medical Temperance Association, which was founded at Stockholm in July, 1907. The executive committee of the National Temperance League passed the following resolution at their meeting on May 24th:—

"That the Executive Committee of the National Temperance League have heard with deep regret of the death of Dr. J. J. Ridge, who has been a Vice-President of the League for over sixteen years. They desire to place on record their high appreciation of the valuable services which Dr. Ridge has unostentatiously rendered to the temperance cause, first by his active co-operation with the League in its early efforts to influence the medical profession, and with the late secretary of the League in his editing the *Medical Temperance Journal* for twenty years; and secondly by his devoted labours as honorary secretary of the British Medical Temperance Association, of which he was the founder."

NATIONAL STANDARDS OF HYGIENE IN THE MERCANTILE SERVICE.—If the condition of the vessels arriving in the port affords any criterion of the standard of marine sanitation of the various countries, an analysis of the vessels inspected at Newport during the last twelve years would lead one to arrange the countries in the following order of merit:—Denmark, 10.5 per cent.; Norway, 11.11; Germany, 11.27; Sweden, 11.4; Austria, 13.27; Great Britain, 13.99; Holland, 18.3; France, 18.5; Russia, 19.5; Portugal, 22.59; Spain, 26.2; Greece, 29.8; Italy, 32.7. (The figures denote the percentage of insanitary vessels.)—*Annual Report for Newport P.S.A., 1907, by Dr. J. Howard-Jones.*

PROCEEDINGS OF THE INCORPORATED
SOCIETY OF MEDICAL OFFICERS OF
HEALTH.

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

AN Extraordinary General Meeting of the Incorporated 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 June 19th, 1908. The meeting was presided over by Dr. George Reid, medical officer of health to the Staffordshire County Council and president of the Society, who was heartily congratulated by the meeting on his return to his official duties after a long and serious illness.

The following members were present: Drs. Hugh Stott, Herbert Jones, H. Cooper Pattin, F. J. Allan, W. J. Bond, G. F. McCleary, G. Quin Lennane, C. J. Thomas, C. W. F. Young, J. Priestley, Sir Shirley F. Murphy, F. E. Fremantle, W. H. Hamer, Wm. Butler.

The SECRETARY having read the notice convening the meeting, the following Articles of Association were discussed, and carried unanimously in the following form:—

1. That the name of the Society be changed to "The Society of Medical Officers of Health," and that the Council be and are hereby authorised to take such steps as may be necessary to carry this Resolution into effect.

2. That the following Article be substituted for Article 2a of the Articles of Association; that is to say—

In the construction of the following Articles, unless repugnant to the context, the singular includes the plural, and the plural the singular; and the following words and expressions have the respective meanings hereinafter assigned to them. The term "Year" means the inclusive period between the first day of October, in any one year, and the last day of September in the following year. "Session" means the period between the Annual Meeting and the last Ordinary Meeting in the year; "Month" means a Calendar Month; "Association" means the Association incorporated by the Memorandum of Association, as "The Society of Medical Officers of Health"; "Branch" means a localised Association of Members of the Association, recognised, or sanctioned, or constituted, by the Council; "Honorary Fellow" means Honorary Fellow of the Association; "Fellow"

means Fellow of the Association; "Associate" means Associate of the Association; "Member" means any Member of the Association not being an Honorary Fellow; "PUBLIC HEALTH" means the Journal of the Association.

3. That the following Article be substituted for Article 3 of the Articles of Association; that is to say—

MEMBERSHIP.

- (a) The Association shall comprise Honorary Fellows, Fellows and Associates.
- (b) Honorary Fellows shall be persons who are eminently distinguished in the cause of Public Health.
- (c) Fellows shall be:—(1) Medical Officers of Health, acting or retired, whether in the British Isles and Dependencies, or elsewhere. (2) Medical Officers (Sanitary) of the Navy and Army (at home or abroad). (3) All registered Medical Practitioners holding a Diploma in Sanitary Science, Public Health or State Medicine, under Section 21 of the Medical Act, 1886. (4) All Medical Inspectors of the Local Government Boards or other Government Departments of England and Wales, Scotland and Ireland. (5) Medical Officers appointed by Education Authorities.

Provided that no such person as may be elected under sub-paragraphs (2), (3) or (5) shall be eligible for office in or shall take part in the Government of the Society unless he be a Medical Officer of Health (acting or retired), or a Medical Officer appointed by the Education Authority.

- (d) Associates shall be persons interested in the advancement of Public Health.

4. That the following Article be substituted for Article 8 of the Articles of Association; that is to say—

Every Member resident in the United Kingdom shall be at liberty to join the Branch whose ordinary place of Meeting shall be most convenient of access to him, and he shall notify in writing to the Honorary Secretary of the Association who is a Member of the Metropolitan Branch, the name of the Branch which he joins. The Honorary Secretary of each

Branch shall forward annually to the Honorary Secretary of the Association, who is a Member of the Metropolitan Branch, within seven days after the meeting of the Branch before the last day of July for the election of Members of Council, a list comprising the names of the several Fellows and Associates attached to the Branch.

5. That the following Article be substituted for Article 10 of the Articles of Association; that is to say—

Candidates for election as Fellows or Associates shall be proposed in writing by two Fellows or Associates at a Meeting of the Association, and shall be balloted for at the next Ordinary, Provincial, or Annual Meeting. The names and addresses and titles of the candidates, with the names of their proposers and seconders, shall be inserted in the notice convening the Meeting of the Association at which the election is to take place. An Associate, upon becoming eligible shall, *ipso facto*, become a Fellow, and shall forthwith notify the fact to the Honorary Secretary of the Association who is a Member of the Metropolitan Branch. All elections shall be by ballot, and no candidate shall be declared elected unless he obtains the votes of four-fifths of the Fellows and Associates present and voting.

6. That the following Article be substituted for Article 11 of the Articles of Association; that is to say—

SUBSCRIPTIONS OF MEMBERS.

Fellows and Associates elected after the first day of October, 1908, shall pay an annual Subscription of Twenty-one Shillings. Payment of these subscriptions shall entitle members to a free copy of PUBLIC HEALTH.

7. That the following Article be substituted for Article 12 of the Articles of Association; that is to say—

All subscriptions shall be due and payable at the commencement of the Session, October. Any Member who shall be in arrears with his subscription for more than one year shall be liable to have his name removed from the Register of the Association, and if his subscription remain unpaid for two years his name shall be removed from the Register; and he shall be liable to pay the amount of

his subscription which was in arrear when he ceased to be a Member. If any new Member shall fail to pay his subscription within three months after election, his election shall be void. Provided that where such member is resident in a foreign country or British Colony, the said period of three months shall be extended to six months after election.

8. That the following Article be substituted for Article 14 of the Articles of Association; that is to say—

The Treasurer of the Association shall pay in every year, on or before the last day of September, to the Treasurer of each of the Branches for Branch Expenses the sum of not less than Two Shillings and Sixpence in respect of every Member of a Branch whose Annual Subscription for the current year shall have been paid to the Treasurer of the Association, and may by Special Resolution of the Council pay travelling expenses of Branch Representatives on the Council of the Association when attending Council Meetings or Meetings of Committees of the Council, provided that in case of any Member who is a Member of more than one Branch the said sum of two shillings and sixpence for Branch expenses shall be paid only to the Treasurer of the Branch to which the said Member shall have been formally joined in accordance with the terms of Article 8.

9. That the following Article be substituted for Article 15 of the Articles of Association; that is to say—

OFFICERS OF THE ASSOCIATION.

The Officers of the Association shall be:—

- (a) A President, who shall be elected at the Ordinary Meeting of the Association in the month of April in every year, by the Fellows from among the Fellows, or Honorary Fellows. The name and address of any Fellow or Honorary Fellow proposed for election as President shall be sent to the Honorary Secretary of the Association, who is a Member of the Metropolitan Branch, in the month of March, fourteen days preceding the election, and, together with the name of the proposer and seconder, shall be inserted in the Notice convening the

Meeting. The election shall be by ballot. The President shall come into office on the first day of October following his election.

- (b) Vice-Presidents, who shall be the past Presidents of the Association and the Presidents for the time being of the several Branches.
- (c) A Treasurer, who shall be a Member of the Metropolitan Branch.
- (d) Two Honorary Secretaries, of whom one shall be a Member of the Metropolitan Branch and one a Member of a Provincial Branch.
- (e) An Editor of PUBLIC HEALTH.
- (f) An Honorary Counsel.
- (h) An Honorary Architect or Surveyor.
- (i) An Honorary Librarian.
- (j) Two or more Trustees of any funds of the Association which it may become necessary or convenient to invest in the names of Trustees, if and whenever the Council shall think fit to appoint such Trustees.

10. *That the following Article be substituted for Article 16 of the Articles of Association; that is to say—*

The Treasurer, the Honorary Secretaries, the Editor, the Honorary Counsel, the Honorary Solicitor or firm of Solicitors, the Honorary Architect or Surveyor and the Honorary Librarian shall be elected annually by the Council at their Meeting in April, and shall come into office on the first day of October following their election. All elections shall be by ballot, and the retiring officers shall be eligible for re-election. The Council shall have power to fill any vacancy that may arise from time to time.

11. *That the following Article be substituted for Article 17 of the Articles of Association; that is to say—*

THE COUNCIL.

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

- (a) The officers of the Association, together with the Honorary Secretaries of all the Branches, *ex officio*.
- (b) Elected representative Fellows, on the direct *pro rata* basis of one represen-

tative of each Branch for every completed fifty Members or part of fifty (over twenty-five) formally joined to such Branch, in accordance with the terms of Article 7, provided that any Branch, the Membership of which includes less than fifty Members, shall be entitled to one elected representative.

12. *That the following Article be substituted for Article 17a of the Articles of Association; that is to say—*

The Council shall be elected as follows:— Before the last day of July, in every year, each Branch shall hold a Meeting for the election of their President and their other representative or representatives on the Council, all of whom shall come into office on the first day of the Session following their election. No Fellow shall be eligible to be elected on the Council, or to vote, whose subscription for the current year shall be unpaid. The Honorary Secretary of each Branch shall, within seven days after the Meeting for the election of Members of the Council, send to the Honorary Secretary of the Association, who is a Member of the Metropolitan Branch, the names and addresses of the President, and of the elected Representatives. In the event of any Branch failing to elect qualified representatives, the Council shall, at their Meeting in September, elect from among the Fellows attached to the Branch, the requisite number of Fellows to represent the Branch on the Council. Any casual vacancy shall be filled up by the Council from Fellows attached to the Branch whose representative shall have ceased to be a Member of the Council. All elections shall be by ballot. The Council shall come into office on the first day of October following their election.

13. *That the following Article be substituted for Article 29 of the Articles of Association; that is to say—*

NOTICES.

All notices to Honorary Fellows and Members shall be deemed duly delivered to them if served personally or sent by post to their last known place of address.

It was unanimously agreed to hold the confirmatory meeting in the Law Courts at Cardiff, on July 17th, 1908, at 1 p.m., and the Executive Secretary was instructed to issue the necessary notices.

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. Report of the L.G.B. for Scotland on Public Slaughter Houses, by Dr. Frederick Dittmar. Bristol, 1907, by Dr. D. S. Davies. Exeter, 1907, by Dr. Edward A. Brash. Report of the Department of Agriculture of the Province of Saskatchewan, for 1906, Port of Liverpool, 1907, by Dr. E. W. Hope. City of Lincoln, 1907, by Dr. Charles Harrison. Minutes of the Metropolitan Asylums Board. City of London, 1907, by Dr. Wm. Collingridge. Annual Report for 1906 of the Sanitary Commissioner with the Government of India, by Dr. John T. W. Leslie. Annual Report of the City Engineer of Hamilton, Canada, 1907. St. Marylebone, M.B., 1907, by Dr. Meredith Young. Royal Borough of Kensington, April 19th, May 16th, by Dr. T. Orme Dudfield. County of Renfrew, 1907, by Dr. A. Campbell Munro. City and County of Newcastle-upon-Tyne, 1907, by Dr. Henry E. Armstrong. Colombo Municipality, 1906, by Dr. Wm. Marshall Philip. Warrington, C.B., 1907, by Dr. J. Coote Hibbert. City of Coventry, 1907, by Dr. E. H. Snell. City of Aberdeen, April and May, by Dr. Matthew Hay. Monthly Bulletin of the State Board of Health of Massachusetts, for April. Croydon C.B., 1907, by Dr. H. Meredith Richards. Wandsworth, M.B., 1907, by Dr. P. Caldwell Smith. Hampstead, M.B., 1907, by Dr. G. F. McCleary. Annual Report of the Women Sanitary Inspectors' Association. Borough of East Ham, 1907, by Dr. G. Sowden.

Journals.

Australasian Medical Gazette. Canadian Practitioner and Review. Bulletin du Service de Santé et l'hygiène. Pacific Medical Journal. Tropical Medicine and Hygiene. Experiment Station Record. Royal Sanitary Institute. American Journal of the Medical Sciences. Hospital. Sanitary Record. Medical Temperance Review. Proceedings of the Royal Society of Medicine. Glasgow Medical Journal. Medical Review of Reviews. Water. Journal d'Hygiène. Municipal Journal. Official Circular of the County Councils Association. Bulletin of the State Board of Health of Maine. Giornale della Reale Società Italiana d'Igiene. Royal Army Medical Corps. Lancet. British Medical Journal. Birmingham Medical Review. American Journal of Public Hygiene. Indian Public Health and Municipal Journal. All-India Hospital Assistants' Journal. The Polyclinic. Tuberculosis. Annali d'Igiene Sperimentale. Transactions of the School Dentists' Society. Royal Institute of Public Health.

Pamphlets.

Contributions from the Sanitary Research Laboratory and Sewage Experiment Station, Mass., U.S.A. On some Non-specific Reactions of Mallein, by H. J. Sudmersen, Ph.D. and A. T. Glenny, B.Sc. Wave-like Variations in Muscular Fatigue Curves, by C. T. Symons, B.A. The Action of Thionyl Chloride and of Phosphorous Pentachloride on the Methylene Ethers of Catechol Derivatives, by George Barger, M.A. D.Sc. The Action of Thionyl Chloride on the Methylene Ethers of Catechol Derivatives, part II. The Milk Problem, by Dr. John C. Thresh.

Experimental Researches on Specific Therapeutics.

By Prof. Paul Ehrlich, M.D., D.Sc. Oxon. H. K. Lewis, London.

Hygiene and Public Health.

By Mrs. Arthur Whitelegge and George Newman. Cassell and Co., London, 7s. 6d.

The Theory of Ions.

By Dr. Wm. Tibbles. Rebman, Ltd., London.

Cast-Iron House Drainage.

With especial reference to the drainage of town houses, by Dr. Gerard J. G. Jensen. Sanitary Publishing Co., Ltd., London.

Public Health Acts.

By Herbert Davey, Barrister-at-Law (1908 edition). Chas. Knight and Co., Ltd., London, 8s. 6d. net.

CORRESPONDENCE.

THE REFERRING OF DEATHS TO DISTRICTS.

To the Editor of PUBLIC HEALTH.

SIR,—The letter of Dr. Garrett on the difficulties of referring deaths to their proper districts has interested me, as I was about writing to you on the subject myself, having lately been experiencing similar difficulties, and having tried without much success to find a solution of them.

I quite agree with Dr. Garrett that only the deaths of persons actually sent from outside districts into a public institution should be excluded from the local returns and referred to the districts from which they came; but even in these definite cases difficulties occur. A new County Asylum has recently been opened at Barnsley Hall in the small district of North Bromsgrove, of which I am medical officer of health.

The deaths in the asylum would double the annual mortality of the district if not excluded. Since the asylum was opened I have sent each month a statement of the death of each "stranger" registered therein to the medical officer of health of the district from which the patient is said to have come. Usually the death is accepted, but in a certain proportion of cases the statement is returned to me for one cause or another, generally with a courteous explanation of the reasons for which the death is declined, often with a helpful suggestion as to the probable correct district, but sometimes with the bald statement "not known" or "not returnable to this district."

Of course, if deaths are deducted from the returns of one district and not added to those of another error is perpetuated; and, thinking that the difficulty must be universal, and that some method of meeting it may have been evolved, I wrote to the Registrar-General about a month ago asking if there were any known way in which these cases of doubtful or disputed locality could be dealt with; but was disappointed on hearing in reply that the Registrar-General, while recognising the difficulty, could offer no suggestion. I should be glad to know how medical officers of health of other districts, which contain large county asylums, dispose of the deaths of "strangers" in the asylum.

Are they content, as I, perforce, have so far been, to exclude the deaths from the local returns, to send notice to the alleged districts to which the deaths belong, and to take no further steps in cases where the death is not accepted by the district to which it has been referred? I estimate that there are some twenty-four such unattached deaths per annum in connection with this one asylum.

Yours faithfully,

Bromsgrove, 6th June, 1908.

H. CAMERON KIDD.

LAW REPORTS.

HOUSE OF LORDS.

February 21st, 1908.

BEFORE LORD CHANCELLOR LOREBURN, LORDS
ROBERTSON AND COLLINS.MONTGOMERY AND CO., LTD., v. COUNCIL OF THE
BURGH OF HADDINGTON.Public Health.—Laying Sewers—Powers under
various Acts.

When a burgh council has power to lay sewers under either the Public Health (Scotland) Act, 1897, or under the Burgh Police (Scotland) Act, 1892, they may proceed wholly under the first-mentioned Act, in which case the consents required by the other Acts are not necessary.

The Council of the Burgh of Haddington had caused sewer pipes to be laid on the surface of the bed of a stream. Certain proprietors of the stream raised an action to have it declared that the Council were not entitled to do so and for an interdict and removal of the works. They relied on a provision in Sect. 217 of the Burgh Police (Scotland) Act, 1892, which requires the consent of the owner before such interference with a stream. The Burgh Sewerage, Drainage and Water Supply (Scotland) Act, 1901, Sect. 5, gave the Council all the powers conferred by the Public Health (Scotland) Act, 1897, upon local authorities under that Act in districts other than burghs. The Council alleged that they had proceeded under the Public Health (Scotland) Act, 1897, and not under the Burgh Police Act, and under the Act of 1897, the consent of the appellants was not required, and they contended that they had an option to proceed under either Act.

The Lord Ordinary and the Second Division of the Court of Session sustained these defences. The appeal was dismissed.

LORD LOREBURN, K.C., in his judgment, said that the Act of 1892 furnished burghs with one method of carrying out sewerage works and the Public Health (Scotland) Act, 1897, furnished burghs with another method. Each of these methods was complete in itself. The defenders could proceed under either Act, and, if under the Act of 1897, the pursuers' consent was not required. They had proceeded under the Act of 1897, and Sect. 217 of the Act of 1892 had therefore no application.

Lord Robertson, in concurring, said that it was doubtful if the legislation was either symmetrical or entirely coherent.

Lord Collins also concurred.

[See Law Reports (1908) A. C. 170.]

February 27th, 1908.

BEFORE THE LORD CHANCELLOR, LORDS MACNAGHTEN
ROBERTSON, ATKINSON & COLLINS.

CAMERONS v. YOUNGS.

Landlord and Tenant—Insanitary House—Infectious Disease—Right of Occupiers other than Tenant to recover damages.

The occupiers of a house other than the tenant cannot recover damages from the landlord for illness caused by the insanitary state of the

drains, although the landlord knew of the defects and had promised to repair them. The implied condition of the law of Scotland that the subject let is to be maintained in tenantable condition confers a contractual right only, and only parties to the contract can recover for its breach.

This was an appeal from part of the judgment of the First Division of the Court of Session, reported at p. 531 of Vol. XIX of PUBLIC HEALTH. In consequence of the bad state of the drains of a house, the tenant, his wife, and certain other members of his family were taken ill with typhoid fever, and incurred serious loss. The First Division held that the tenant was entitled to recover for the losses he had sustained, but that the other members of the family could not do so, as they were not parties to the contract of letting. These latter pursuers appealed to the House of Lords from this part of the judgment. The appeal was dismissed.

Lord ROBERTSON, who delivered the principal judgment, said the question was whether the appellants who were not parties to the contract of lease had a good ground of action against the landlord. He was clear they had not. In the letting of houses in Scottish towns, in the absence of agreement to the contrary, the law implied that the landlord shall not only give the tenant a habitable house, but maintain it in that state. This liability of the landlord was contractual, and gave no rights to other parties to sue.

The other noble lords concurred.

[For full report see 45 Sc. L. R. 410.]

SUPREME COURT OF JUDICATURE.
COURT OF APPEAL.

April 30th, May 1st and 4th, 1908.

BEFORE SIR GORELL BARNES (President P. D. and
A. Division) FLETCHER MOULTON, and FARWELL,
L., JJ.

FERGUSON v. MALVERN URBAN DISTRICT COUNCIL.

Nuisance—Escape of Sewage—Pollution of Water
—Water from the defendants' land—No right
to use the water.

If a person draws off and uses water collected on another person's land without the knowledge of that person, no licence to use the water can be inferred, and the person on whose land the water was collected is not liable for loss caused by reason of the water being polluted by sewage, although such pollution may have been caused by him.

The facts of this case are reported ante at p. 86. The plaintiff was awarded £7,500 as damage for injuries caused by reason of an outbreak of typhoid fever at his hydropathic establishment at Malvern. The jury found that the defendant council had allowed sewage to escape into a certain water supply which the plaintiff had used, and that this was the cause of the outbreak. The jury also found that the plaintiff had no property in the water flowing from the polluted source into

his tanks, and that he had no licence from the owners to use the water.

On these findings both sides asked for judgment, and LAWRENCE, J., entered judgment for the plaintiff. The defendants appealed. The Court allowed the appeal.

SIR GORELL BARNES said that the conclusion he arrived at from the facts and the findings of the jury was that the plaintiff was, without the defendants' knowledge, taking water from the waste pipe or drain which carried the water from their land to an old brick pit, some one, not the plaintiff, having at some time or other made a rough connection with this waste pipe by means of a pipe leading to the plaintiff's dietetic tank, at a point about half-way to the brick pit. The plaintiff did not ascertain the source of this supply until 1902. The water was collected on the defendants' land and sent down their own waste pipe, and the pollution occurred on the defendants' land. The defendants did not know of the connection, nor did they know of the escape of the sewage which caused the pollution. If the defendants had known of the connection and that the plaintiff was using the water, a licence to use the water might perhaps be reasonably inferred. The plaintiff was using water which belonged to the defendants without any right to do so. There was, in those circumstances, no evidence of any damage to the plaintiff, except that which was brought about by his own act in thus taking the water. There was no breach of any duty on the part of the defendants towards him. Judgment must, therefore, be entered for the defendants.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

December 9th, 1907.

FARMER v. LONG.

Public Health (London) Act, 1891.—Nuisance—
Procedure—Leaking drain.

In consequence of an anonymous communication, a drain was tested and no nuisance found. Afterwards it was opened up and found to be leaking. On proceedings taken to abate the nuisance the magistrate found that there was a "leaking drain." This was held to be a sufficient finding of a nuisance to entitle him to make an abatement order, and that the manner in which the nuisance was discovered was immaterial.

This was a case stated by a metropolitan police magistrate on the hearing of a summons requiring the appellant as owner of certain premises to abate a nuisance. It appeared that the sanitary authority received a complaint on an anonymous post card, and that in consequence the drains were tested with no result. The authority then caused them to be opened up and found that the drain had been laid with clay joints, that the clay had completely perished, and that the drain was leaking. No one had complained of any smell or other nuisance. The magistrate made an order to abate the nuisance. The court dismissed the appeal.

CHANNELL, J., in the course of his judgment said that if what was discovered was a nuisance, it

did not signify whether it was discovered by proper or improper means. He thought that the finding that the drain was leaking was a sufficient finding of a nuisance—a mere defective drain might not be a nuisance.

Bray and Sutton, J.J., agreed.

[For full report see 72 J.P. 91].

March, 1908.

BEFORE GRANTHAM, J., AND A SPECIAL JURY.

BROWN v. BUTLER.

Negligence—Water Supply—Pollution by Sewage
—Typhoid Fever—Damages.

The plaintiff in this case was the widow of Mr. H. W. Brown, formerly farm bailiff at the Three Counties Asylum, near Arlesey, Bedfordshire. The defendant was the clerk to the committee of visitors of the asylum. The action was brought to recover damages for the loss of her husband, which the plaintiff alleged was caused by the defendant's negligence in supplying her husband with impure water for his consumption. Improper medical treatment was also alleged, but this was withdrawn, and the jury exonerated the medical attendant from all blame.

Mrs. Brown, the plaintiff, stated that her husband was appointed farm bailiff to the Three Counties Asylum in 1892 at a salary of £125 per annum with a cottage within the asylum grounds. A supply of water was laid on to the cottage. The water was pumped from two wells into softening tanks, and carried thence to water towers, and from there supplied to the inmates of the asylum and to the deceased's cottage. On July 20th, 1906, witness and her husband went to Yarmouth for a holiday and returned on July 25th. On August 22nd her husband first complained of being ill. The case was subsequently found to be one of typhoid fever, and he died on October 1st. She had frequently complained of the water, both to the resident engineer and to Ekins, the steward of the asylum, who had said that the drains were in a bad state. There were 1,200 people living on the asylum estate, and the drains passed near the wells. All the people on the estate were supplied with water from those wells.

Mr. W. H. Scott, who had been resident engineer from 1895 to 1900, said the wells had been from time to time in a filthy condition, and that he had had them cleaned out. There was water oozing through the brickwork which smelt like sewage. Mr. Graham, M.I.C.E., who had examined the wells and drains recently, considered the conditions were highly dangerous. Dr. W. Bullock and Mr. E. Bousfield, M.R.C.S., gave evidence to the effect that the fact of no typhoid germ having been found in the water did not preclude the possibility of a person having caught typhoid fever from the water. It was very difficult to detect the bacillus in water among other bacteria.

Evidence was also called to show that the deceased was in good health after his return from Yarmouth, but there was evidence on the part of the defence that he had suffered from diarrhoea early in August.

Ekins, the steward to the asylum, said the water was perfectly good; it was occasionally turbid when it was turned on after having been stopped.

Dr. Langworthy Laurie, who attended the deceased, said he made a provisional diagnosis on August 24th that the deceased was suffering from influenza. Typhoid fever and influenza were very much alike in their early stages. Later, he considered that Brown had also ambulatory typhoid. Dr. Dixon, medical officer at the asylum, said that in the summer of 1906, there were no cases of typhoid among the patients. There were fifteen cases of diarrhoea and four deaths; one patient died of enteritis and another of colitis.

Dr. S. E. de Lisle, resident medical superintendent of the asylum, gave evidence that they had had sixteen cases of typhoid after September 10th.

Sir Thomas Stevenson said that he had made an inquiry into the circumstances relating to Brown's death. He thought it probable that Brown contracted the disease twelve days before August 6th. Yarmouth was seldom free from typhoid; it was continually being imported by sailors, who were very prone to ambulatory typhoid. Having regard to the facts of the present case, in his view the water supply was certainly not the cause of the outbreak. He could not account for the inmates escaping if the general water supply was contaminated. The bacillus coli was present in the water, and this might be due to rats or drains. The amount of chlorine which he found indicated that such impurities as were present were not caused by sewage. In the water which percolated into the well there was less chlorine than there was in the well water.

Evidence was given to the effect that other cases of typhoid had occurred in the neighbourhood outside the asylum.

The Jury found a verdict for the plaintiff for £650, for which judgment was entered.

April 6th, 1908.

BEFORE LORD ALVERSTONE, L.C.J. RIDLEY AND DARLING, JJ.

WILKINSON v. ALTON.

Margarine Act, 1887, Sect. 3.—Meaning of "Margarine"—New Butter Substitute.

All substances prepared for sale in imitation of butter must be sold as margarine and comply with the terms of the Margarine Act, 1887, and it is immaterial whether they are made of vegetable or animal fats and whether or not they were known at the date of the passing of that Act.

This was a case stated by the justices for Derby on the hearing of an information against the respondent, Alton, for selling margarine by retail without complying with the terms of the Margarine Act, 1887, as to branding the package with the name "margarine," and as to delivering it in a paper wrapper printed with the name "margarine." The article in question was sold as butter, or as nut cream butter. The paper case in which it was enclosed had printed on it the words "Nut Cream Butter," but not the word

"margarine." The sample was certified by the analyst as consisting wholly of margarine and containing no butter.

For the respondent evidence was given to show that the substance was made wholly from nuts, that it contained no animal fat whatsoever, and that it was a compound unknown at the date of the Margarine Act, 1887. It was stated, also, that up to the date of the passing of that Act all margarine, commonly so called, was made of animal fat, and that the name was then and had ever since been ordinarily applied to compounds containing animal fat and no others.

The justices dismissed the summons, as they were of opinion that although the sample had been prepared in imitation of butter, they thought that this vegetable compound did not come within the purview of the Act. The Court allowed the appeal.

ALVERSTONE, L.C.J., in giving judgment, said that Sect. 3 of the Margarine Act, 1887, provided that the word "margarine" shall mean all substances, whether compounds or otherwise, prepared in imitation of butter and whether mixed with butter or not, and no such substance shall be sold except under the name of margarine and under the conditions set forth in the Act. The justices had found that this substance had been prepared in imitation of butter, and it therefore fell within the definition. The appeal must, therefore, be allowed and the case remitted to the justices.

Ridley and Darling concurred.

[For full report see 72 J.P. 252.]

May 8th, 1908.

BEFORE LORD ALVERSTONE, L.C.J., AND A SPECIAL JURY.

NEWBURY v. PEROWNE.

Warranty—Sale of Tuberculous Bullock—Duty of Vendor.

This action was brought by a butcher for damages, in respect of the purchase by him of a bullock, which, when slaughtered, was found to be suffering from tuberculosis. The defendant was a farmer, who had reared the bullock, and had sent it with two others, to the Central Fat Cattle Market, Islington. They were then bought by the plaintiff for £63. An inspector had been called in and had condemned the whole carcass as unfit for food, and so also had the medical officer of health. The disease was of long standing. The plaintiff said that a butcher could not detect the disease until the animal was slaughtered, but that the defendant could have done so.

Mr. O. Williams, ex-president of the Royal College of Veterinary Surgeons, and veterinary surgeon to the King, said that during the life of an animal an ordinarily competent person would be able to notice indication of the disease. Witness said that there were well-known means, known as tuberculin injections, by which a farmer could discover whether his cattle were suffering from tuberculosis. But it was not a common practice for farmers to adopt these means.

The defence was that the defendant gave no warranty, that the bullock was fit for human food, that the plaintiff did not rely on the defendant's skill and judgment, and that he had no knowledge whatever that the animal was suffering from any disease whatever. The defendant stated in evidence that the animal never showed signs of disease, and was fat, and seemed in good condition.

Mr. John Macfadyen, principal of the Edinburgh College of Veterinary Surgeons, said there was abundant evidence to show that not less than 20 per cent. of adult cattle in this country are affected by tuberculosis in some degree. As to the use of injection to detect the disease, he thought it was not a test a farmer could use.

The jury returned a verdict for the defendant, finding that the plaintiff did not rely on the defendant's skill and judgment, and that the defendant by reasonable skill could not have ascertained that the animal was suffering from the disease.—Judgment accordingly.

June 1st, 1908.

BEFORE LORD ALVERSTONE, L.C.J., DARLING AND SUTTON, JJ.

CULLEN v. McNAIR.

Sale of Food and Drugs Act, 1875, Sect. 3.—Cream mixed with boracic acid—Sale of such as Cream.

When an article is sold as cream, an offence will be committed under Sect. 3 of the Sale of Food and Drugs Act, 1875, if such article is a mixture of cream and boracic acid in such proportion as to be injurious to invalids and children. It might be otherwise if the sale was one of a stated or known mixture of cream and boracic acid.

This was a case stated by the Chairman of the County of London Quarter Sessions on the hearing of an appeal from a conviction by a police magistrate at Westminster Police Court. The Quarter Sessions affirmed the conviction. (See PUBLIC HEALTH, Vol. 20, p. 282.)

The sale was made by Cullen to an assistant of McNair, an inspector of the Westminster City Council under the Sale of Food and Drugs Act. The article was mixed with 0.313 per cent. of boracic acid, and proceedings were taken under Sect. 3 of the Sale of Food and Drugs Act, 1875. The Court held that preserved cream was harmless when taken by a normal adult person in ordinary quantities if the quantity of boracic acid did not exceed the above amount, or even if it was as high as 35 grains to the pound, but that it was injurious to the health of invalids and children.

The Court affirmed the conviction and dismissed the appeal.

THE LORD CHIEF JUSTICE: In my opinion we ought not to interfere in this case. I wish it to be understood that I must dismiss from my mind altogether the matters that have been told us quite outside of the case. I am very sorry, but I cannot allow them to be taken into my consideration. For

instance, we have been told that they have been over and over again to the Local Government Board to ask them to interfere, and they will not. There is no statement of that kind in the case. Personally, I should not be disposed to credit it without a statement being made, but, at any rate, we cannot allow that sort of statement to be made by counsel to influence us in this case. Now the article sold here was sold as cream. It is described as cream. It is described as rich cream, and it is then further said that this cream contains a small percentage of boron preservative to retard sourness. I suppose that people know that cream goes sour, and, therefore, in my opinion, it is not sufficient under such a sale, and under such a label, to say it ought to be treated as an article which has passed away from being cream and has become preserved cream, and the case finds that no indication beyond the label was given to the purchaser as to its composition. Now they have found "that the boracic acid contained in preserved cream might be used by dishonest traders to mask decomposition and any impurity in the cream, but that boracic acid was generally used by the trade for the purpose of keeping the cream good for several days, varying from two to six." Under those circumstances it seems to me this is a matter as to which, if there is evidence of it being injurious to health, the public ought to be more protected than they are at the present time. The magistrates have found, as a fact, that it is injurious to children and invalids; and both the original magistrates and the magistrates at Quarter Sessions have thought that the article, as it was, and used as it was, was an article which was injurious to a substantial portion of the community. It must not be thought that I think they ought to find a thing injurious to health because some exceptional individual is liable to have some particular injury done to his health, such as lead poisoning or anything of that sort, by eating some particular article of food. It is a case in which, upon the case stated, the cream, if given to children or invalids, is injurious to health. It seems to me it is open to the magistrates to say that a person who did that had mixed with an article of food an ingredient so as to render the article injurious to health, with the intent that the same shall be sold in that state. I express no opinion as to what the magistrates ought to decide in cases where notices have been given that it is not to be taken by infants, by invalids or by children, or where some other steps have been taken to protect, but it seems to me that, where you have a sale of cream *simpliciter*, and this article given, it was open to the magistrates to find, as a fact, that it was injurious to health within the section. They have so found it, and I do not think, upon these facts, that it is open to the appellants to say that the people to whom it was injurious were such a small percentage that the magistrates' finding is bad in law. I think, therefore, this appeal must be dismissed.

Darling, J., concurred with regret.

Sutton, J., thought the conviction was right as the appellant sold cream and not preserved cream.

RECENT PUBLIC HEALTH LITERATURE.

Armies, Diseases of.

SHARPE (Capt. W. S.). Diseases likely to occur on the occasion of the mobilization of a territorial army. *Jour. Roy. Army Med. Corps*, 1908, x, 571.

Beri-Beri.

DELANY (T. H.). Epidemic Dropsy or beri-beri in Eastern Bengal. *Chart. Indian Med. Gaz.*, 1908, xliii, 167.

Blackwater Fever.

SKELTON (Capt. D. S.). Some observations on Blackwater fever. *Jour. Roy. Army Med. Corps*, 1908, x, 602.

Children, Care of.

KOPLIK (H.). Prophylaxis in the care of children in hospitals. *Lancet*, 1908, i, 1470.—NEWMAYER (S. W.). Defective vision and the mentally subnormal child. *New York Med. Jour.*, 1908, lxxvii, 880.—ROYSTER (L. T.). The medical profession's duty to the children of America. *New York Med. Jour.*, 1908, lxxvii, 930.

Cholera.

ROSENTHAL (W.). Untersuchungen über die filtration von Hühner pestvirus und von feinsten bakterien. *Zeit. für Hygiene*, 1908, lx, 169.

Diphtheria.

MASON (J. W.). Diphtheria in elementary schools and its prevention. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 221.

Disinfectants.

KEDZIE (F. S.). Disinfectants, their relative values and uses. *Pub. Health, Mich.*, 1908, iii, 32.—LANGEMANN. Autan in der Desinfektionspraxis. *Hygien. Rundschau.*, 1908, xviii, 633.

Dysentery.

HAENISCH. Über "Ruhr" in Irrenanstalten. *Zeit. für Hygiene*, 1908, lx, 245.—KONRICH (F.). Über eine isoliert gebliebene epidemie bazillaren Ruhr in Mitteldeutschland und einen dabei gefundenen. *Zeit. für Hygiene*, 1908, lx, 281.

Flies.

NEWSTEAD (R.). On the habits, life cycle, and breeding places of the common house-fly (*Musca domestica*, Linn.). Six plates. *Annals of Trop. Med. and Parasitology*, 1908, i, 507.

Hygiene, Public.

SOUTHWORTH (B. H.). Revision of the health laws in Michigan. *Pub. Health, Mich.*, 1908, iii, 36.

Immunity.

TORREY (J. C.). A study of natural and acquired immunity of guinea-pigs to gonococcus. *Jour. of Med. Research*, 1908, xviii, 347.

Infant Feeding.

JOHNSON (L.). The necessity for the artificial feeding of infants. *Amer. Jour. of Obstet.*, 1908, lvii, 671.

Infant Mortality.

PHILLIPS (W. C.). A plan for reducing infant mortality in New York City. *Med. Rec., New York*, 1908, lxxiii, 890.

Infection.

BRYANT (W. S.). Air-borne infections, their mode of entrance, prevention, abortive and ameliorative treatment. *Med. Rec., New York*, 1908, lxxiii, 816.—CUMSTON (H.). Infectious diseases. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 233.—SAWYER (W. A.). General streptococcus infection through unrecognised channels: A report of three cases. *Boston Med. & Surg. Jour.*, 1908, clviii, 693.

Leprosy.

ASHMEAD (A. S.). Some considerations on the question of leprosy transmission by insects and fish. *Pac. Med. Jour.*, 1908, li, 292.

Malaria.

TUCKER (E. F. G.). Malarial cirrhosis of the liver. *Lancet*, 1908, i, 1474.

Malta Fever.

EYRE (J. W. H.). The Milroy lectures on melitensis septicæmia (Malta or Mediterranean fever). *Lancet*, 1908, i, 1677.

Measles.

HERMAN (C.). Is disinfection after measles necessary in tenements and private dwellings? *Pediatrics*, 1908, xx, 284.

Meningitis, Cerebro-spinal.

ASHBURN (P. M.) and C. F. CRAIG. A comparative study of Tsutsugamushi disease and spotted or tick fever of Montana. *Boston Med. & Surg. Jour.*, 1908, clviii, 749.—WILSON (J. A.). A contribution to the bacteriology of cerebro-spinal meningitis. *Lancet*, 1908, i, 1686.

Milk.

CHERRY (T.). The Melbourne milk supply. *Intercol. Med. Jour. of Australas.*, 1908, xiii, 207.—HALE (H. E.). The calculation of milk percentages with rules and examples. *Arch. of Pediatrics*, 1908, xxv, 337.—THRESH (J. C.). The milk problem, or the production and distribution of pure, clean milk. *Med. Press*, 1908, i, 606, 636.—VAN SLYKE (L. L.). Conditions affecting the proportions of fat and proteins in cows' milk. *New York Med. Jour.*, 1908, lxxvii, 1021.

Opsonins.

LOVEDAY (G. E.) and A. RAMSBOTTOM. The value of opsonic methods in diagnosis and treatment. *Med. Chron.*, 1908, 4th Ser., xv, 145.

Plague.

BUCHANAN (Lieut.-Col. A.). Cats as plague preventers. *Brit. Med. Jour.*, 1908, i, 1285.—CHOKSEY (K. B. N. H.). On recent progress in the serum therapy of plague. *Brit. Med. Jour.*, 1908, i, 1282.—LAMB (G.). Some remarks on the Report on Plague in Calcutta for the year ending June 30th, 1907. *Indian Med. Gaz.*, 1908, xliii, 161.—SHEN-NAN (T.). The propagation of plague. *Edin. Med. Jour.*, 1908, xxiii, 524.—STRONG (R. P.). Protective inoculation against plague. *Jour. of Med. Research*, 1908, xviii, 325.

Rabies.

SEMPLE (D.). On the preparation and use of anti-rabic serum, and on the rabicidal properties of the serum of patients after undergoing anti-rabic treatment; also a note on the blood of a patient suffering from hydrophobia. *Lancet*, 1908, i, 1611.

Schools.

HERDMAN (E. K.). Medical inspection of public schools. *Pub. Health, Mich.*, 1908, iii, 19.—MAC-MURCHY (HELEN). The medical inspection of schools. *Canada Lancet*, 1908, xli, 669.—WATSON (A. M.). Medical inspection of schools. *Scot. Med. & Surg. Jour.*, 1908, xxii, 407.

Small-pox.

SEHEULT (R.). On an epidemic of small-pox of irregular type in Trinidad during 1902-4. *Proc. Roy. Soc. of Med.*, 1908, i, *Epidem. Sect.*, p. 229.

Syphilis.

CAMPBELL (R. P.). The spirochaete pallida: its relation to syphilis; a review of the literature. *Montreal Med. Jour.*, 1908, xxxvii, 347.

Public Health

THE JOURNAL OF THE

Incorporated Society of Medical Officers of Health.

No. 6.

AUGUST, 1908.

VOL. XXI.

THE FOOD REGULATIONS OF THE LOCAL GOVERNMENT BOARD.

THE author of "The Jungle" may or may not be an accurate recorder of facts, but it cannot be denied that he has done much for public health progress. In the first place, he was remarkably successful in making the public think about the purity of what they eat; the British householder, who for years had viewed with equanimity the feeding of his children on milk, which the most cursory examination would have revealed to be polluted with manure, suddenly became roused to something like panic by Mr. Upton Sinclair's account of the preparation of food in the Chicago packing-houses. But "The Jungle" did more than merely frighten the public. It supplied the momentum necessary to overcome the various kinds of obstruction that always stand in the way of public health legislation; and we may reasonably doubt whether, without the momentum so supplied, the public would have secured the protection afforded by the United States Meat Inspection Act, 1906, or our own Public Health (Regulations as to Food) Act, 1907. In view of these results, medical officers of health, who, with hope deferred, are still awaiting the appearance of the long-promised Milk Bill, may feel some regret that Mr. Sinclair, having been so successful with meat, should not employ his efficacious pen on the far more important subject of milk.

The Public Health (Regulations as to Food) Act, 1907, empowers the Local Government Board to make regulations "authorizing measures to be taken for the prevention of danger arising to public health from the importation, preparation, storage and distribution of articles of food and drink (other than drugs and water) intended for sale for human consumption"; and the Board have now issued two sets of draft regulations, one entitled "Unsound Food (First Series)," the

other "Foreign Meat." The first set of regulations will come into operation on September 1st, 1908, the second on November 1st, 1908. These regulations contain stringent provisions directed against the importation of unwholesome food, and medical officers of health in certain districts are invested with special powers to deal with imported scrap meat, preservative tripe, tongues and kidneys, and various kinds of pork. The duties thus imposed upon medical officers of health are highly onerous and responsible, and call for the exercise of considerable care and discretion; and it should be noted that sanitary authorities may, with the consent of the Board, appoint and pay a legally qualified medical practitioner to act in the execution of the regulations, either in place of, or as an assistant to, the medical officer of health. It is impossible properly to appreciate the value of any enactments until they have been put to the test of actual administration, but these regulations have evidently been carefully drafted, and should materially strengthen our sanitary code, which is admittedly defective in the protection it affords the public against the consumption of unwholesome food.

The regulations are obviously based upon the information supplied by the excellent series of reports of the Inspector of Foods, which the Local Government Board have recently issued, the latest of which—Dr. MacFadden's report on preservatives in meat foods packed in cases or glass—is noticed in another column. These reports have furnished information which medical officers of health have found of considerable practical value in administration, and they have demonstrated that, while preventing the importation of unwholesome foreign food, we must not omit to control our own manufacturing processes. This is a matter which doubtless will receive due consideration in the framing of subsequent regulations under the Public Health (Regulations as to Food) Act.

A CASE FOR INQUIRY.

THE action of the Bilston Urban District Council in dismissing Dr. Ridley Bailey, the medical officer of health for the district, from his position as medical superintendent of the local fever hospital appears to have caused considerable indignation amongst the members of the medical profession. The members of the council who were in favour of this extraordinary step seem to have admitted that Dr. Ridley Bailey has done excellent service in both offices, and that there have been no complaints as to the manner in which he has discharged his duties, and the only reason brought forward in support of their action was that the two appointments should not be held by one officer. It appears, however, to be the general custom for two such appointments to be held by the same individual, provided, of course, that he is able to cope with the work; and in the case of Bilston—the population being only some 25,000—there is no question on this point. In such cases this custom is recognised to be in the best interests of public health.

Upon hearing of the proposed dismissal of Dr. Ridley Bailey, the South Staffordshire Division of the British Medical Association addressed the following communication to the Bilston Council:—

Sir,—On behalf of the South Staffordshire Division of the British Medical Association, representing a large majority of medical practitioners of South Staffordshire, we are desired most respectfully to request the consideration by your council of the following points in connection with the notice which it is publicly reported has been given by a member of your council to move at the next meeting of the council, that three months' notice be given to terminate the appointment of Dr. Bailey, medical officer of health for Bilston, as medical officer of the fever hospital.

1. That the general custom of appointing the medical officer of health of a district as medical superintendent of the local fever hospital rests upon obvious grounds of public convenience, and should not be departed from except upon equally clear and cogent reasons of public interest.

2. That, so far as the medical profession in South Staffordshire are aware, no considerations of public health or public interest have been brought forward in favour of the suggested severance of these two offices in Bilston.

3. That the present medical officer of the fever hospital has held the post for fifteen years, during which period there have been

no complaints as to the manner in which he has discharged his duties, either to the patients in that institution, to the district council, or to the ratepayers generally.

4. That the dismissal of a public officer under such circumstances, without clear reason of public interest assigned, would have the effect of a vote of censure, for which no justification has been put forward, nor, in the opinion of the general body of Dr. Bailey's professional colleagues in the district, can be put forward.

5. That the efficiency of a public service, especially one involving such grave responsibility to the community as the department of public health, depends upon attracting men of integrity, capacity, and good repute; that members of the medical profession possessing such qualifications will not accept appointments unless there is reason to suppose that their tenure will be undisturbed so long as they discharge their duties efficiently, and no important considerations of the public service call for a change.

6. That the suggested change in the medical officership of the fever hospital at Bilston would be contrary to these principles, and must have the effect of depreciating the reputation among the medical profession of public appointments under the Bilston District Council.

Your council will, we feel sure, appreciate that the representations now made are put forward by a body representing the medical profession generally, not in the interests of individuals, but in the interests purely of the public service, in a matter upon which medical practitioners are, as we trust your council will recognise, specially qualified to offer an opinion.

We are authorized to say that the statements in this letter as regards general considerations have the approval of the Public Health Committee of the British Medical Association.—We are, sir, your obedient servants,

HENRY MALET,
Chairman,

J. ALFRED CODD,
Hon. Sec. South Staffs Division British
Medical Association.

In spite of this communication and the indignant protests of some of the councillors, the Bilston Council resolved, by nine votes to four, "That three months' notice be given to the medical superintendent at the infectious diseases hospital to terminate his appointment."

The action of the Bilston Council in thus dismissing a well-tried and highly competent officer requires more explanation than has yet been furnished, and we hope that the Local Government Board will hold an inquiry into the circumstances of this remarkable case.

THE BOARD OF EDUCATION AND SCHOOL HYGIENE.

THE Board of Education have recently issued two important documents, both of which demand the careful consideration of those who are engaged in the work of school hygiene. These documents are (1) the Code of Regulations of public elementary schools, and (2) the Regulations for the training of elementary school teachers. When these regulations are compared with those in force in former years, it will be seen that in both sets alterations have been made which are of considerable importance from the public health point of view.

Turning first to the code, it may be said that the alterations that relate specially to school hygiene are of two kinds. (1) A variety of provisions affecting generally the health of school children, and (2) medical inspection. Among the former are Article 18, which requires that school premises shall be healthy, safe in case of fire, adequately lighted, warmed, ventilated, cleaned and drained, and Article 44 (g) which provides that in making up the minimum time required in order that an attendance may be reckoned for grant, there may be included "any time spent during the ordinary school term at an open-air school, school camp, or other place selected with a view to an improvement of the health and physical condition of the children." No alteration has been made respecting school closure by the sanitary authority except that the appeal to the Board has been withdrawn. The code gives considerable authority to the "School Medical Officer," that officer being defined in Article 44 (g) as "a medical officer named by the Local Education Authority and recognised as such by the Board." In the prefatory memorandum to the code it is stated that the chief school medical officer "should, as a rule, be the person placed in charge of the work of medical inspection," and that "it is very desirable that he should either be the same person as the medical officer of health or be under his supervision or control."

The introduction of the medical inspection of school children has, naturally, necessitated various alterations in the new code, the most important being Article 25 (c), which makes "satisfactory provision" for medical inspection a condition of receiving the annual grant. The code does not specify what constitutes "satisfactory provision," beyond stating in Article 58, that the inspection must

take place so far as practicable on school premises, and that in the year ending July 31st, 1909, provision must be made for the inspection "of all children admitted to school since August 1st, 1908, and of all children who are expected to leave school before July 31st, 1909." It may be assumed, however, that the Board will require that the work of medical inspection shall be carried out on the lines laid down in their memorandum of November 22nd, 1907, and the subsequent circular of January 23rd, 1908. In estimating the efficiency with which the local education authorities carry out this work, the Board will doubtless be guided by local reports and other documents; but we may venture to hope that more direct sources of information will not be neglected, and that the Board will not proceed on the assumption, to use the famous phrase of John Simon, "that a free consumption of stationery may serve instead of skilled visitation."

The new set of regulations for teachers is another document of considerable importance from the public health point of view, for it introduces for the first time a compulsory hygiene course and a compulsory examination in hygiene for students in training colleges who intend to be teachers. This is a measure that has long been warmly advocated by many medical officers of health, and we are glad that it has at last been carried into effect. These regulations and the new code afford unmistakable evidence that the Board of Education are being well advised in matters relating to public health.

THE PREVENTION OF CONSUMPTION.

DR. T. ORME DUDFIELD, in his recently published annual report, discusses at some length the present position of the tuberculosis question, particularly as it affects London; and we give elsewhere a valuable and interesting extract from this part of his report. Dr. Dudfield has well earned the right to be heard on this subject. The oldest medical officer of health now holding office, he has for many years been a strenuous pioneer in the cause of hygienic progress, and his influence on the development of British public health administration has been considerable. Of late years he has devoted special attention to the prevention of consumption, particularly to the provision of sanatoria for the poor; but, though remarkably successful in securing influential support for his proposal that the Metropolitan Asylums Board should become the sanatorium authority for London, that

proposal so far has not been carried into effect. Dr. Dudfield's account of the matter is well worth study, and, like Simon's "English Sanitary Institutions," it will afford future historians valuable material from which they may learn of the peculiarly depressing opposition against which public health reformers have had to contend. Fortunately, however, it has been found that projects that are obviously in the best interests of the public prevail sooner or later over the "monetary considerations" which, for the moment, have proved too strong for Dr. Dudfield; and we may hope, therefore, that before long he will witness the triumph of the cause to which he has devoted the later years of his long and valuable life.

MILK ADULTERATION.

ON page 227 of our present issue will be found an account of a remarkable case of milk adulteration. A milk carrier was seen by the inspector to add a quantity of water from a horse trough to the churn of milk from which he was serving his customers; but when a sample of this milk was taken, it was found on analysis to be well above the standard laid down in the milk regulations of the Board of Agriculture. The milkman, however, carried on his barrow a hand-can that contained milk to which water, presumably, had not been added, and a sample of this milk was also taken. On analysis it was found that, when the milk from the hand-can was taken as a standard, the milk from the churn could be regarded as containing 2 per cent. of added water, and the analyst made out his certificate accordingly. Proceedings were instituted, and the milkman, who conducted his own case, was fined £5. Section 20 of the Sale of Food and Drugs Act, 1875, provides that, as a condition precedent to a prosecution, it must appear from the analyst's certificate "that an offence against some one of the provisions of this Act has been committed," and it is not easy to see how this provision could have been complied with in this case, had it not been for the analyst's ingenious use of the milk in the hand-can as a standard. Even so, it is questionable whether the decision of the magistrates would have been upheld by the High Court, and it appears to be possible to commit a flagrant act of adulteration in the presence of the inspector, and yet escape a conviction under the statutes that were passed specially to prevent adulteration. In view of the low standard adopted by the Board of Agriculture, the point is not unimportant, and we shall be glad to receive news of similar cases.

THE GROWTH OF CITIES IN RELATION TO TOWN PLANNING.*

By A. K. CHALMERS, M.D.,
Medical Officer of Health, Glasgow.

IN inviting your attention to this subject, I do not propose to enter into any detailed criticism of the proposals now before Parliament in the Housing and Town Planning Bill of the President of the Local Government Board for England.

For this there is an obvious reason in the shortness of time available for discussion. But an equally, if not a more cogent one, is that individual views of the present proposals will largely be influenced by individual experience of the defects of existing provisions; and should we thus limit the area of discussion, we shall miss many things which are of importance. For much that has been done in the past towards housing reform has been accomplished outside the present Acts altogether, either by special legislation in the form of local improvement Acts and by philanthropy, as well as by industrial expansion, which, in the form of railway clearances and by absorption for business purposes, has displaced no inconsiderable proportion of the populations formerly living in insanitary areas.

It is true that the present Bill aims at something more than past housing legislation has done—at something, indeed, which is quite different from it—by providing for schemes for town planning. And to make the difference, as it were, more distinct, these schemes need not be limited to unbuilt ground within the district of a given local authority, but may be applied to any land in its neighbourhood, which appears likely to be used for building purposes.

The object of any such scheme is to ensure amenity and convenience in connection with the laying out and use of the land over which it extends as well as to provide for its sanitary condition. There is, further, an interesting provision in Clause 46 (3), which appears to regard such an area as experimental ground for differentiating the various functions of public health administration, so that, in the words of the Act, the authority responsible for the execution of the scheme may be one of the local authorities concerned, or for certain purposes of the scheme one local authority, and for certain other purposes another local authority. Not only so, but a joint body may be constituted especially for the purpose, and

* Read before the Provincial Meeting of the Incorporated Society of Medical Officers of Health at Glasgow, on June 27th, 1908.

this body is to be endowed with all necessary powers for carrying out the objects of the scheme.

It may be suggested that this is an extension of a principle implied, if not expressed, in the Housing (Amendment) Act of 1900, which enabled a local authority to acquire land beyond its own area—that is, within the area of another local authority—for the purpose of erecting houses thereon under Part III. of the principal Act.

The illustration is scarcely a parallel one, however, for the purchasing authority in the one case acquired no administrative function in the land whereon the housing scheme is to be carried out; but it implies a frank admission that the problem of housing town populations may not, and in the given case cannot, be efficiently dealt with within the area of the authority primarily interested.

It is at this point—namely, the recognition by the Legislature that the requirements of life in towns, and indeed wherever masses of population are wrestling with the problem of a collective existence, extend beyond the limits of existing administrative boundaries—that we may take up the aspect of the question that I have more particularly in view.

Past Experience.—We shall probably best get into touch with this aspect of the question by some short reference to the original conditions out of which the modern problem of housing arose.

During the past seventy years or so—indeed, ever since the industrial dislocation which followed the wars of Napoleon, and the unequal, if not indifferent, administration of the laws for the relief of the poor led to the appointment of the first Poor Law Commission—the condition under which life is passed in the industrial quarters of towns has rarely for any long period been absent from the mind of the Legislature, and for almost sixty years of this period a succession of general Housing and Public Health Acts, and Acts for local Improvement purposes, represents the efforts made to remove the administrative difficulties which experience was from time to time disclosing. Moreover, the difficulties themselves were arising from entirely novel conditions.

New forces were transforming the national life. Railways and industrial expansion were adding fluidity to the hitherto fixed character of our population. Trade and commerce were

proving more powerful stimuli to collective energy than wars of conquest had done. Migration to the towns was proceeding at a rate formerly unknown, and to the old method of replacing the wastage of town populations from this source alone there was added the but recently acquired art of recruiting their numbers also from the natural increment which accrues when the births exceed the deaths in number.

The first results of these combined sources of growth we know. The convergence of commercial routes and a ready access to new sources of mineral wealth were the strategic points in the new movement, and populations became industrial or commercial or both, according to the differing opportunities afforded them. For the hygienist the problem lay in the uncontrolled aggregations of population which thus resulted, and it only required the disclosures of the first Poor Law Commission to pave the way for an inquiry into the health of towns.

Here was inaugurated the beginning of the movement for improving the sanitation of towns, and in the wealth of legislation which followed, there grew up a complex, if not confused, system of Local Administration which, in 1869, led to the Royal Sanitary Commission and a re-arrangement of the central and local authorities.

Through all this legislation there ran a chord of sympathy with the toiling masses of the great towns which is easily distinguishable in the writings of the period and of which the dominant note is the burden which neglect of sanitary provisions entails.

It was seen to be at once a cause and a consequence of poverty.

It told on the efficiency of the worker. If he escaped untimely death from infectious disease he was still exposed to the risk of more or less permanent invalidism from disease which was also to some extent preventable, although not in any sense infectious.

It may here be suggested that housing reform implies much more than improved sanitation of the home and its surroundings, and I agree; but there is sometimes displayed by many who are genuinely interested in the question what seems to me a regrettable tendency to dwell on these other factors to the neglect of that on which the problem is primarily based—I mean the occupancy of a house which is unfit for human habitation.

To such I would quote the words of Sir John Simon in describing the sanitary conditions of the London poor now many years ago:—

"Who can wonder if personal and moral degradation conform them more and more to the physical debasement of their abode? In the midst of inevitable domestic filth who can wonder that personal cleanliness should be neglected? In an atmosphere that forbids the breath to be drawn freely, which maintains habitual ill-health, which depresses all the spring and buoyancy of life, who can wonder that frequent recourse should be had to stimulants, which, however pernicious in themselves, still for a moment dispel the malarious languor of the place, give temporary vigour to the brain and cheer the flagging pulses of a poisoned circulation? Who can wonder that habits of improvidence and recklessness should arise in a population which not only has much ignorance and prejudice amongst it but is likewise often unaccustomed to consideration and kindness? Who can wonder that the laws of Society should at times be forgotten by those whom the eyes of Society habitually overlook, and whom the heart of Society often appears to discard?"

Since these words were written, almost a generation has passed and much progress towards reform has been made.

By every test which can be applied, the general character of the housing of town population has been improved. Each census has shown this.

In Scotland, according to a return recently issued by the Registrar-General^o the proportion of population living in one-roomed houses has fallen in forty years (1861-1901) from 26 per cent. to 11 per cent.; while the proportion living in two rooms has risen from 37·7 to 39·5 per cent., in three rooms from 12·6 to 19·9 per cent., in four rooms from 6·4 to 9·1 per cent. In Glasgow the average house has undergone a gradual enlargement in size and the occupants per room a gradual reduction in number¹ and this latter which is the important sanitary factor, is true for all the large towns in Scotland.

Moreover, as we know, the death-rate of towns now approximates that which formerly obtained in rural districts, and the life of the worker has been extended at its most useful period.

But when all this has been said, it remains true that there are still many districts in all our cities where, despite the improvement which has taken place, the lives of the inhabitants are spent amidst a succession of scenes of squalid misery.

^o Housing Conditions (Scotland) Cd. 4016, 1908.

¹ Census Report, 1901, by Medical Officer of Health.

One² illustration I take from our midst, because it presents, I think, a pretty fair sample of the problems of sanitation in a Scotch town at the present time.

Area.—It is an area bounded by wide well-made streets, and, if we include half their width, it extends to 13,000 square yards.

Houses.—It contains 443 houses, 357 of which are ticketed, 202 are single apartments, 209 two-apartments, and 1 four-apartment houses; 11 one-apartment and 5 two-apartment houses are "farmed-out"; 3 one-apartment, 8 two-apartment, and 8 three-apartment houses are let in lodgings; 29 one-apartment houses, 35 two-apartment, and 1 three-apartment houses are empty.

Shops.—There are 57 shops in the area, of which 6 are public-houses, and there are 5 where food is sold.

Occupation of Inhabitants.—This varied, but workers in skilled handicrafts were by no means numerous. Of 301 households where information was ascertained, 164 were labourers or carters, 22 domestics, and 24 cleaners or charwomen.

Rentals.—The rents of the one-apartment houses average from 7s. to 11s., of the two-apartment houses from 13s. 6d. to 16s. 8d. per month.

Lighting and Ventilation.—One hundred and twenty-six of the houses are deficient in free space in front of their windows of one or more of their apartments, and the internal ventilation of the lobbies and staircases is in many cases defective.

Density.—The density or persons per acre is 550, if half the width of the streets is included, but excluding this it is 929; in other words, if the population were distributed equally throughout the area there would be 8·8 square yards per person only, as compared with 66·7 for the city as a whole.

Vital Statistics.—The birth-rate is 49 per 1,000, the death-rate 41. The infantile death-rate is 230 per 1,000 born, while that for the city is 131. From diseases of the respiratory organs the death-rate is 9·5 per 1,000; the corresponding rate for the city is 3·5.

Economic Conditions—Failure to Pay Rates.—

1. *For Police Purposes.*—It is our custom in Glasgow to assess the occupiers of

² Medical Officer's Report, 1906.

houses of small rentals between £4 and £10 annually at only one-half the rate levied for certain police purposes on rentals exceeding the latter amount. The proportions unpaid during 1906-7 were as follows:—

Grading.	City.	Insanitary Area.
1. By occupiers at rentals £10 and over, assessed full rates	0·744	1·878
2. By occupiers at rentals £4 to £10, assessed half rates for certain purposes ...	24·171	62·646
Proportion unpaid ...	24·915	64·524

2. *For Poor Law and Education.*—The method of classifying here enables a distinction to be drawn between the several causes of failure to pay, and an allocation to be made to the several classes of the proportion of the total amount unrecovered for each.

Class.	Parish of Glasgow.		Area.	
	Percentage of persons not paying to total persons chargeable.	Percentage of amount unpaid to total amount leviable.	Percentage of persons not paying to total persons chargeable.	Percentage of amount unpaid to total amount leviable.
Paupers ...	1·798	0·286	4·585	3·719
Inability ..	8·162	1·012	3·220	22·727
Irrecoverable ...	6·483	1·010	30·349	21·074
	16·443	2·308	38·154	47·520

Much significance attaches to the proportion here called "Irrecoverable," because it indicates that one-fifth of the total amount leviable in this area was lost through the migratory habits of 30 per cent. of the population inhabiting it. For this group includes none of those whom the poor law authorities recognise as paupers nor, any who, after inquiry showed reason for being exempted from payment. It consists almost wholly of those for whom the postal legend is "Gone—No address"—and who, if not the pariahs, are at least the nomads of city life.

As we have seen, the movement for improving the sanitation of towns set out with a perfectly definite object.

Disease is a powerful stimulus to reform, and our present systems of water supply,

scavenging, and of sewage disposal, and of regulating the occupancy of houses, are some of the results.

At an early period also, many authorities were tentatively feeling their way, through local provisions, towards a code of building regulations which would prevent those uncontrolled massings of population which had formerly marked the growth of towns.

But that the results are wholly satisfactory, no one maintains.

It is told by Sir Ian Hamilton, in his work on the Japanese war, that officers of the Japanese staff could distinguish between country and town regiments, even when at a distance, by the difference in their staying powers in difficult positions.

For a nation which in 1890 had barely 6 per cent. of its population in "great cities" and had no city with a population exceeding 200,000, this is somewhat remarkable testimony to the difficulty which a race may experience in maintaining its physique when the trend of national life changes and it undertakes the problem of healthy town life.

A more serious indictment, however, is sometimes made, and the following statement by a leading medical journal is worth quoting, although we may not subscribe to all it implies. "It is beginning to be recognised (says this writer), "that the progress of hygiene is attended with the disadvantage of burdening the community with an increasing number of useless lives and a tendency in some measure to sap the strength of the race by lowering the standard of vitality, and of bodily, mental and moral power in those by whom it is propagated."³

I am not concerned with controverting the writer's conclusions, but most of us would, I think, place a different interpretation on some of the facts which seem to have suggested them.

That racial dangers do attend the ever increasing masses of our population who pass their existence in towns under existing conditions, requires almost no argument, but so far as they are definable they arise not from advances in hygiene, but because of its neglect; and when they belong to the group, which for want of a better term, may be called neuropathic, and of which hooliganism is the most obtrusive type—are we not too prone to suggest degenerate parentage and degraded

³ British Medical Journal, June 13th, 1908.

home life as the cause, instead of seeking the true explanation in the wholly artificial life of a city child. In his complete divorce from nature as God made it, and in the necessity for finding on the streets and amidst the whirl of passing traffic, that freedom for play, which should be his birthright, he undergoes a lop-sided development which forms a basis for the hooliganism of later years. Hooliganism, indeed, is wholly a disease of town life.

Parks and open spaces no doubt have their value here as local correctives, but experience is teaching the cities that these must be supplied on a more generous scale in the future.

Again, however, the argument illustrates, not the defects of hygienic advancement, but the neglect of things essential to it.

I have said little of the influence of the home on the character of the children, because the conception of home implies the existence of something which is relatively permanent, and this can scarcely be said to exist in the 30 per cent. of the small group I have described to you who found it convenient to remove their dwellings before the rate collector made his call.

If our present methods have failed to influence the lives of these sections of our populations, we should hesitate before regarding them as utterly irreclaimable until, at least, we have made clear that there are no houses unfit for human habitation in which they may find even temporary shelter.

That they have missed sharing in the social and sanitary advancement of recent years is but too obvious, and it may be that the astounding reduction in the death-rates of towns during the last thirty years has, by its very magnitude, obscured the fact that some were sharing in it only to a limited extent, if at all.

But the well-being of a city demands more than the abolition or reconstruction of its worst houses. They form, as it were, the inner citadel around which the neglect of former days has built a rampart of insanitary conditions, now levelled by the weapons of modern sanitation in the form of pure water supplies, scavenging and drainage.

But if it is reasonable to expect that the death-rate of towns may be reduced to that of the rural districts—and we can at least imagine conditions in which this is possible—there remains the question of the physical efficiency of town populations, on which the life of the nation must now more than ever

depend. This indeed is the problem which we in Britain have set ourselves to solve by concentrating three-fourths of our population in towns.

I need not recall to you the origin of the movement for the Inspection of School Children or the results of recent inquiries on the basis of house room, and between this and their educational progress. If these investigations do not yet amount to evidence, they at least suggest an intimate relationship between house room and dietary on the one hand, and physical efficiency and educational progress on the other.*

And their importance to us in Glasgow is that even the children from families in two-apartment houses, who constitute 47 per cent. of the population, compare so unfavourably with those from houses of larger size.

That defects in dietary may be here quite as important a factor as deficiency in house room is, I think, possible, and we want in all our towns inquiries such as those carried out by Dr. Noel Paton and others in Edinburgh, and more recently by Mr. De La Touche and Dr. Stafford in Dublin.

But it raises anew the question whether current views regarding density of population do not require revision, more especially in Scotch towns, where, with our predilection for three and four-storied tenements, the number of persons housed per acre is apt to run to excessive figures.

Prevention of disease is not here in question so much as the physical efficiency of no inconsiderable portion of our population.

Imperfect use of Existing Legislation, with some defects.—We have just seen that housing—using the term in its widest sense—as a social index, may be regarded as at once a cause of disease and of physical defect, and forms the central problem of town sanitation. But it has been suggested that the operation

* For information regarding condition of children in Glasgow see—

- (a) Report of Physical Training (Scotland) Commission, 1903.
- (b) An inquiry into the physique of Glasgow school children. *Trans. Royal Sanitary Institute (Glasgow Congress)*, 1904.
- (c) Physical inspection of school children in relation to public health administration. Conference on School Hygiene (Royal Sanitary Institute), February, 1905.
- (d) Report by Education Department (Scotland) of inquiry into condition of Glasgow school children, 1907.

of Housing Acts has frequently resulted (1) In creating a house-famine; (2) In leading to overcrowding; (3) In raising the value of the slum property which remains, and (4) In leaving untouched a considerable number of houses which are still insanitary.

With regard to the first of these objections, it would seem that in rural districts some scarcity of houses may exist, but the general improvement in the standard of housing which the census returns disclose, hardly supports the suggestion that absolute scarcity of houses at any time exists. And if the past affords any guide as to what may be expected in the future, periods of great displacement of population will always be accompanied by periods of active house building. This was notably the case in Glasgow during the Improvement Trust Displacements early in the '70's, and it was so also in Birmingham.

The *Spectator*, if I mistake not, in an article now some years ago, with reference to this very point, expressed the opinion that the public mind never would be convinced that difficulty in finding suitable houses existed until it saw the displaced tenants from insanitary buildings seeking shelter in tents in the street.

But while this dread of creating a house famine, or of producing even local overcrowding beyond the area of displacement is not, I think, founded on fact, the mere apprehension that such might result is tending to restrain local authorities from rigorously exercising the provisions of the Acts. And so we find the President of the Local Government Board, in introducing the present bill to the House of Commons, stating that Local Authorities had not made sufficient effort to exercise the powers presently existing for improving the sanitary conditions of houses.

But the hesitation to which I have alluded is supplemented from another source. Disappointment is expressed with many of the results of displacement. Slum areas have been re-constructed, but the slum is reproduced elsewhere. The new populations of the re-constructed areas have mostly "been selected from the well-doing and from those who have shown some measure of desire to do well and are willing to continue the effort to do so." †

† Report of Glasgow Housing Commission, pp. 19-20.

We need scarcely wonder if the temptation to feel and express disappointment with these efforts is yielded to. But the effect on public policy is to be regretted.

Because reconstruction areas are costly and fail to meet the case of the displaced tenant, there has been a growing disposition to leave the tenant in his surroundings, and find excuse in the reflection that in himself he is in some sense a contributory cause of the surrounding degradation. Whether this be the case or no, local authorities are, if not lax, much less enthusiastic in the demolition of insanitary areas than formerly, and this, partly I think, because re-housing has come to absorb more attention than the displacement of populations who are insanitarily housed. Indeed, the movement in the course of years has changed front, and the gravity of the conditions which pervade the insanitary area have suffered by comparison with the cost of removing them.

The requirements of the Act to provide accommodation equivalent to the number of persons displaced has thus operated in some measure to defeat its main object, and so, instead of displacement schemes from insanitary areas, we have come to think mainly of re-housing; that is, demolition has come to be regarded mainly as an incident in a scheme for reconstruction. The emphasis has thus fallen on the wrong place, the primary object of all housing reform being to displace from houses which are unfit for habitation. For replacement of populations has never taken place in the sense originally intended, and there exists no scheme municipal or otherwise, save those with which the name of Miss Octavia Hill is so honourably associated, which can point to populations reclaimed along with the houses which they inhabit.

Can the present tendency to Aggregation be limited?—We have seen that cities still contain scattered groups of population, living under conditions, somewhat similar in character to those which first attracted attention to them, and originated the movement for reform. There is also some evidence to suggest that simple massing of populations, even under the improved conditions, which modern sanitation has created, leaves something to be desired in the physique of the children who are growing up under them. For this reason I have indicated that our

standards of density need revision, *i.e.*, that the number of persons who may be housed on a given area of soil requires some limitation. Indeed we lose something of the advantage of wide streets in the correspondingly tall houses which flank them. Lower buildings and wider intervals between them seem to me to be a necessity for the future, more especially in our Scotch towns with our flatted tenement system. But even should we be able to restrict the number of persons on a given area, can we limit the number of contiguous areas similarly occupied. That is, can we control aggregation as distinguished from density? The history of the growth of towns supplies the answer. To an industrial nation, grouping of population is necessary, and when commerce and the industrial arts combine in a common centre, they produce aggregations as we know them. London and Liverpool are probably the best illustrations we have of purely commercial centres; Manchester and Glasgow are both industrial and commercial. So long as food supplies can be imported, their growth will continue to respond to the demands of their special industries. Even in this respect, however, the character of an industrial centre undergoes change, and yet the expansion of population continues.

Two illustrations of this I am able to submit to you in a table which I have obtained through the courtesy of Mr. H. M. Robinson, Deputy Inspector of Factories.

Clyde ships go everywhere, and the Clyde, we fondly think, means Glasgow. But ship-building in Glasgow is a lost art if we reason only by topographical boundaries. In thirty odd years the number of persons employed in ship-building in Glasgow has shrunk from 13,000 to 1,000. So also in Manchester, which once was "famous for its cottons." Reduced to the inexorable logic of an official return, "Manchester cottons" can now only afford employment to 8,000 persons in place of 20,000 formerly. Of course we are perfectly familiar with the fallacy underlying such a statement. The truth is, London and Liverpool, Manchester and Glasgow, have long since ceased to represent units of population. They have become place-names for large surrounding districts, which are relatively almost as densely peopled as themselves.

Evidence of Increasing Stability in the Structure of Town Populations.—Change, therefore, in the staple industry of a population or displacement outwards, is, in reality, what takes place; it does not necessarily entail restriction in its growth, although in the Clyde Valley we are fortunately situated in respect of the great variety of our industries.

Moreover, considerations based on the structure of populations suggest inherent sources of growth which tend to give them permanency. If we take for illustration Glasgow and the suburban burghs of Govan and

FACTORIES (IN SPECIFIED INDUSTRIES) AND PERSONS EMPLOYED THEREIN IN GLASGOW AND MANCHESTER
IN 1871 AND 1904.

GLASGOW.						MANCHESTER.					
1871.			1901.			1871.			1901.		
Industries.	Works.	Persons employed	Industries.	Works or Depts.	Persons employed	Industries.	Works.	Persons employed	Industries.	Works or Depts.	Persons employed
Blast furnaces	3	1,230	Smelting of iron	1	252	Cotton (textile processes)	111	20,346	Cotton (textile processes)	73	8,033
Iron mills	6	3,920	Iron mills	8	3,807						
Foundries	43	5,239	Foundries	113	9,289	Mnftre. of machinery	83	8,981	Mnftre. of machinery	197	14,607
Mnftre. of Machinery	78	13,857	Mnftre. of mehry., &c.	242	23,597						
Iron ship-building	15*	43,031*	Ship & boat building	17	1,048						

* These totals are identical with those for the whole county of Lanark, and it seems probable that they refer to a larger district than the city of Glasgow.

Partick, we find that during the past forty years, an increasing proportion of their populations have been drawn from a relatively limited area. In 1861 eighty-one persons in every hundred of the population of Glasgow were of Scottish birth; now there are nearly eighty-six. A similar proportion obtained in 1871, but whereas in this year 57 per cent. only of its Scottish inhabitants had been born in the city or county of Lanark, in which it is situated, this proportion had risen in

1901 to 71 per cent. And conversely, while 42 per cent. of the Scottish inhabitants in 1871 were drawn from other parts of Scotland, this proportion in 1901 had been reduced to 28 per cent. In Govan and Partick the proportions closely follow these, and even Coatbridge—a purely industrial burgh in Lanarkshire—shows some indication of movement in the same direction over the only decade for which information is available.

TABLE SHOWING NATIONALITY OF POPULATION OF VARIOUS BURGHS IN SCOTLAND IN EACH CENSUS YEAR, 1861 TO 1901.

SCOTLAND.							
Year.	In County.	Out of County	Total Scotch.	Irish.	English.	Colonies, etc.	Foreigners.
1861 ...	—	—	90·970	6·664	1·851	0·385	0·130
1871 ...	—	—	91·117	6·184	2·118	0·441	0·140
1881 ...	—	—	87·116	8·634	3·221	0·727	0·302
1891 ...	—	—	88·700	6·807	3·501	0·687	0·305
1901 ...	—	—	88·427	6·323	3·838	0·830	0·582

GLASGOW.							
1861 ...	—	—	81·005	15·697	2·665	0·506	0·127
1871 ...	57·835	42·147	81·912	14·320	3·067	0·493	0·208
1881 ...	68·704	31·296	82·829	13·123	3·169	0·575	0·304
1891 ...	68·949	31·051	85·244	10·038	3·691	0·648	0·379
1901 ...	71·760	28·240	85·720	8·877	3·720	0·793	0·890

GOVAN.							
1861 ...	—	—	—	—	—	—	—
1871 ...	—	—	—	—	—	—	—
1881 ...	57·458	42·542	81·215	14·040	3·787	0·784	0·174
1891 ...	62·891	37·109	85·929	9·440	3·932	0·562	0·137
1901 ...	65·839	34·161	84·077	11·510	3·531	0·621	0·261

PARTICK.							
1861 ...	—	—	—	—	—	—	—
1871 ...	—	—	—	—	—	—	—
1881 ...	62·939	37·061	77·877	18·289	3·013	0·661	0·160
1891 ...	62·414	37·586	81·693	14·068	3·396	0·627	0·216
1901 ...	65·465	34·535	82·520	12·050	4·203	1·032	0·195

COATBRIDGE.

Year.	In County.	Out of County.	Total Scotch.	Irish.	English.	Colonies, etc.	Foreigners.
1861 ...	—	—	—	—	—	—	—
1871 ...	—	—	—	—	—	—	—
1881 ...	—	—	—	—	—	—	—
1891 ...	83,573	16,427	80,975	15,625	2,980	0,339	0,080
1901 ...	84,439	15,561	81,025	15,158	2,920	0,386	0,511

These facts are, I think, not without meaning, for they indicate that populations developed the power of internal growth, which is quite distinct from additions to population, which arise from immigration and are consequently liable to wide fluctuations and even cessation.

The modern city has, as it were, wrenched from Nature the secret of growth, a gift which would appear to have been denied to the cities of the past, and it is this which makes the problem of town life to-day quite without a parallel.

Town Planning necessary over Large Areas.—Where, then, does this argument lead us, and how does it affect the question of town planning? As I have suggested, so long as we can buy in our food supplies and maintain our markets, the massing of population in towns is likely to continue. I greatly doubt whether industry and commerce can well be combined with agriculture in the same population. The problem will be to regulate its conditions. We no longer concentrate for protection—Vienna long ago demolished its ramparts and created a boulevard in their place—but, for organisation, industry demands it. The mediæval city was held together by a common bond, of danger at least, if not of interest, but more frequently of both. In any case, it produced a unity of mutual purpose, which is lacking in our modern groupings.

The modern city has no name, or rather it has a multiplicity of names, and the interests of its several parts are sometimes supposed to be divergent. Here it is that the present Bill may, I think, prove of advantage if its provision for schemes of planning for the future be but liberally interpreted.

But as a basis for this we shall have to be agreed upon some things which seem to me essential. What these are may best be indicated in a few questions, and I would ask, in

the first place, as it is of the greatest importance: Do we at the present time frankly recognise the corporate life which keeps industrial units together? The cities of old found expression for it in the public ceremonies, which were at once religious and patriotic in their character; it was maintained in spirit if not in form through the trade guilds of the Middle Ages.*

For this the modern city has found no substitute. There has been much organisation for administrative purposes, but little or no co-ordination of its several functions.

Take the map of any industrial area, and plot out on it the various administrative units of which it is composed, the results suggest administrative chaos. Education, Poor Law, hospitals, police, health, water supply, cleansing, the maintenance of roads, transport, rating—all are functions of corporate life.

Yet they overlap in confusion so profound that a comparison of pauperism with industrial dislocation, and with crime and disease, becomes almost unreliable, and even the cost of each to the community is barely ascertainable.

There are some functions of administration which are best exercised within limited areas. But unless we recognise that town planning must include all the units of population which industrial pursuits have gathered together, we shall, I think, fail to give expression to that conception of civic unity which, although often but feebly expressed, lies at the bottom of our present-day administration.

Were this spirit to obtain free expression, many of the apparent difficulties which lie behind all questions of differential rating would, in the end, find some practical solution.

It is because Part II of the present Bill is fitted to pave the way to this higher realisation of civic life that its provisions are, I think, worthy of careful study.

* See "The Meaning of History," by Frederick Harrison.

DISCUSSION.

Dr. E. SERGEANT considered that it was very desirable to arrange life in towns better than it had been, for there was unquestionably a distinct relation between bad housing and intemperance. The Housing and Town Planning Bill had undoubtedly great possibilities for cities like Glasgow and Liverpool, but he feared it would be a dead letter in small urban and in rural districts, chiefly owing to the fact that there was no over-riding authority such as the county council.

Dr. JOHN ORTON referred to the danger of placing new houses upon the minimum of space allowed by the model bye-laws, and feared that in this way slums were being created for future years. He regretted that hitherto so little provision had been made for recreation grounds for children.

Dr. TEMPLEMAN said he agreed with most of the paper, but with regard to some of the points, his experience did not tally with that of Dr. Chalmers. For one thing, Dr. Chalmers emphasized pretty strongly that, in most housing schemes, reconstruction was looming much more largely than demolition. That was not the case in Dundee, where the municipality had done nothing in the way of providing houses, but had done a very great deal in abolishing bad dwellings. He considered that the necessity was urgent for the Town Planning Bill in large towns where it became inevitable that the surrounding area should come within the town.

Bailie GUEST said that, although we had made efficient strides in the way of town planning, yet he believed we were far too sensitive as to the liberty of the subject, and if we could only get more effectual control over those who did not pay taxes, but who were a very destructive class, we should improve the conditions of city life in a very short time. He attributed hooliganism in a great measure to the loss of the trade guilds and the abolition of the system of apprenticeship. In Glasgow, the corporation had dealt with a large amount of insanitary property and replaced it with better buildings, but these had been occupied by a different class to those for whom they were intended. He advocated in all large towns a much wider sphere of administration over adjoining areas.

Dr. KNIGHT said that the density of population was greater in Scotland than elsewhere, and steps should be taken to avoid a repetition of the mistakes that had been made in the past. He spoke with regret of the erection in the country roads and lanes near Glasgow of tall tenements similar to those found in the city itself.

Dr. DITTMAR said, when they saw a great city like Glasgow, with miles of houses and with scarcely a green spot, the necessity for a town planning scheme was obvious. The whole idea of town planning was a natural development of their other housing Acts, local and general. It came to this, that instead of allowing our towns to be built haphazard and any way a builder liked, we wished a town to be able to say beforehand how streets

were to be laid out, how buildings were to be built, and what space should be between the blocks of buildings, so that the rising generation should not have to go for miles to find an open space or be forced to play in the streets.

Professor EBENEZER DUNCAN spoke of the difficulty of doing away with tenement dwellings in Scottish towns, and said he was sorry to see that in some districts of Glasgow and its suburbs, not four-storey, but five-storey tenements were being built. There was a great talk about tenements being necessary on account of the price of land. The price of land had risen simply because tenements had been permissible. It was for Glasgow and other towns to take into consideration whether they should not approach Parliament to restrict houses to not more than three storeys.

Dr. WILSON said he should welcome any joint action with regard to town planning. He thought the time had come when they should have some central authority for adjusting boundaries between the great cities and the areas round about.

MILK ADULTERATION.—One of the cases of milk adulteration calls for special mention. On September 7th I received private information that a certain milk carrier made a practice of adding to his milk every morning a quantity of water from the horse trough at the corner of Willow Road and Christchurch Road. On a subsequent morning two inspectors watched for this man, and at 7.40 a.m. they saw him wheel his barrow up Willow Road, accompanied by a boy. Having passed the horse trough the boy took a two-quart can from the barrow and went back to the trough. After carefully looking round to see that the coast was clear, the boy plunged the can into the trough, filled it with water, and then overtook the man near the corner of Gayton Crescent and Willow Road. The barrow was then pushed round Gayton Crescent as far as the bend, when the milkman stopped the barrow and emptied the can of water into the churn, and then proceeded to serve his customers. The inspectors, who were concealed during these operations, took two samples of the milk, one from the churn and one from a hand-can on the barrow, to which the water from the trough had not been added. The public analyst found that both samples were well above the legal standard of purity laid down in the Sale of Milk Regulations of the Board of Agriculture, but he also found that if he took the presumably genuine milk in the hand-can as a standard, the milk in the churn contained two per cent. of added water, and he made out his certificate on that basis. Proceedings were accordingly instituted, and the defendant, who alleged that the water in the horse trough was clean and fit for the purpose for which he used it, was fined five pounds. The case well illustrates the inadequacy of the present law relating to adulteration. If it had not been for the fact that, in this case it was possible to take another sample of milk as a standard, a conviction could not have been secured, although the inspectors actually witnessed a deliberate act of adulteration.—*Annual Report for Hampstead, 1907, by Dr. G. F. McCleary.*

THE PURIFICATION OF SEWAGE ON SLATE BEDS.*

By W. J. DIBDIN, F.I.C., F.C.S., Etc.

IN attempting to dispose of sewage matters without obtaining a profit from the process, the wisest plan is to utilise the forces of nature as completely as possible and to employ as many grades of life as we conveniently can.

Natural conditions of waste disposal vary so as to permit the survival of many organisms in different places. We have to select the methods of nature which exist where man can live healthily and develop his powers without inconvenience from the waste substances he produces. In selecting these conditions there are two points which can serve as a guide.

One is that the life of a running stream is preferable from the human standpoint to that of a stagnant pond. Where stagnant ponds abound man is inconvenienced by the organisms whose survival is thereby rendered possible. We must, therefore, avoid anything in the nature of stagnation or of a cesspit.

The other point is allied to the first. Heaped accumulations of waste organic matter are offensive and dangerous. Their neighbourhood is unhealthy. We must, therefore, avoid the accumulation of solid offensive refuse in bulk.

The reason for the offensive decay both of stagnant dissolved matters and heaped solids is in the non-supply of an adequate amount of oxygen to allow the preponderating development of aerobic organisms. Offensive putrefaction is the symptom of anaerobic action. That aerobic action is non-putrefactive is shown by the condition of a body of fresh water into which is discharged an amount of sewage insufficient to cause a reduction of the maintained aeration below the degree essential to aerobic life.

In the case of the Thames and London sewage, the disposal of the solids is effected by dispersal in tidal waters in the estuary, and the effluent is diluted in the Thames, which, till now, has been able to take it without offence.

Where a body of non-potable water is not available for dilution, the aerobic forces of nature can be utilized by scientific irrigation of suitable land. Here the top thin layer of soil contains the purifying agents, and was

* Read before the West of England and South Wales Branch of the Society of Medical Officers of Health on March 19th, 1908.

called the "living earth" by the late Dr. Vivian Poore. When suitable land is not available, and we have to arrange artificial methods for the natural forces to do their work, the same conditions should be observed. The opportunity for the cultivation of the same quality and variety of aerobic organisms should be provided.

In view of the possibility that at some future time the Thames would be inadequate for the dilution of the London effluent, and because land was not economically available for London, I made experiments with regard to effluent filtration following the experience already obtained in the filtration of potable waters. I found that the aerobic bacteria which predominate in a fine contact bed are comparable to those common to well-aerated streams, and purify, as is well known, the dissolved substances in the same manner as when dilution in a stream is effected.

I designed the coarse contact bed to effect the inoffensive disposal of the solids, and the first beds were installed at Sutton. In many cases, after some years' use, it was found that the resulting humus and the detritus of the sewage accumulated as earthy residues in the interstices of the beds, and necessitated their cleansing in order to restore their capacity.

Further, when these beds were overworked, putrefaction ensued from mal-aeration.

Although the cost of cleansing is very low, as is doubtless well-known to you from the Manchester and Burnley reports, and does not justify the introduction of preliminary treatment in unnatural anaerobic tanks, I decided to try to obviate the choking, and consequent necessity for cleansing, of the coarse beds. I found that a bed constructed of thin layers of material, separated so as to allow a considerable water capacity, provided a skeleton for the employment of the forces at work on irrigation plots and in aerated streams. The accidental realization of the possibility of utilizing the immense amount of waste slate at the Welsh quarries enabled me to put the design into practical and economical form.

The action of the slate bed is the action of a series of irrigation surfaces superimposed instead of spread out in one plane. The effective surface is the layer of living earth produced on each slate by the action of aerobic organisms on the deposited sewage matters. The beds are fully matured when this deposit is about a quarter of an inch average in depth.

This depth is not exceeded on the average during the year for reasons I am about to give.

The older deposit is converted as in irrigation into a mould or earth containing vast numbers of animals and bacteria. The numerous worms and protozoa are a feature of its content. The bulk is a gelatinous mass of bacteria in zoogloea form in which are mixed the cellulose fibres and grit of the sewage and other matters which are refractory or indigestible.

The gelatinous mass breaks away at the edges of the slates and is discharged with the effluent at the rate of some two grains per gallon averaged over the year, a quantity Dr. Gilbert Fowler calls a "trace." From a strong sewage, such as that of Devizes, the average deposit per filling may be taken as about one-fortieth of an inch in depth. These fresh sewage solids form food for the organisms in the worked-out "earth" beneath them, and are rendered inoffensive by the digestive processes of the animal organisms, which, as is well known, attack the less stable portions first. Ultimately, the new deposit is merged in the gelatinous mass, and the residue is discharged with the effluent as described.

The presence of such organisms as worms is a guarantee that at no time can there be a preponderance of offensive anaerobic organisms. The maintenance of aeration is provided by the rest periods after the beds have been emptied after two hours standing full. During the rest period empty, the destruction of the solids continues, just as in land treatment when the liquid has drained off, leaving them exposed to the air. The maintenance of aeration during filling and resting full is provided by the air trapped under the slates.

The effluent is naturally highly charged with aerobic bacteria, and is, therefore, in a very suitable condition for further treatment on land, by dilution, or on secondary beds.

The reduction of the debris from the slate beds, as compared with the mass of sludge obtained by chemical precipitation, is shown by the following figures:—

In two and a half years, by chemical precipitation, about 8,500 tons of sludge were obtained, which was pressed to 1,700 tons of pressed cake. In the next two and a half years about fifty tons only of inoffensive earth have been collected from the effluent channel of the slate beds, and from the surface of the clinker beds.

The secondary treatment at Devizes is on fine contact beds. Unfortunately, a ferruginous clinker was used, and the subsequent oxidation and swelling of the iron into a spongy form has lowered the capacity of the beds considerably. They would be restored by re-sifting and washing.

The following analysis of clinker will show where the trouble occurs:—

	No. 1 Bed. Per cent.	No. 5 Bed Per cent.
Retained on 1/4-inch mesh	42.0	11.1
" " 1/8-inch "	20.0	26.2
" " 1/16-inch "	2.8	14.2
" " 1/32-inch "	0.8	6.0
Passed 1/32-inch "	10.4	19.6
Moisture	24.0	22.9
	100.0	100.0
Anhydrous oxide of iron in the fine material passing 1/32-inch mesh	9.9	9.5
Water of hydration and organic matter in the clinker as received	4.1	5.6

These results show that the organic matter, after allowing for the water of hydration, is very small.

The quantity of suitable materials in these clinkers is, for No. 1 bed, equal to 75 per cent. of the volume of clinker, and in No. 2 bed equal to 62 per cent. of the volume of the clinker at present in use.

The final treatment is on land. But for the contract to send the effluent over this land, triple treatment on beds would at times be necessary for this sewage, which often contains over 400 grains of suspended matter per gallon, and in other respects is of an average strength six times that of London sewage.

The particular feature of the works to which I would draw your attention is, of course, the work done in the slate beds, and the difference between the results obtained and those from any other system for the disposal of solids.

There is no separate compartment or cultivation tank for the exclusive benefit of anaerobic bacteria. Consequently, putrefactive organisms are restricted, and cannot develop sufficiently to cause a nuisance any more than they can in a well-aerated running stream. The stagnant pond condition is entirely avoided.

The system is, in fact, a permanent adaptation of those natural processes which do not inconvenience man, and requires no renewal, because the material is permanent and the beds are self-cleansing.

DISCUSSION.

MR. WALLIS STODDART stated that he was very pleased to have the opportunity of seeing the slate beds in company with Mr. Dibdin, and to have certain points cleared up. He understood that slate beds did not represent the fullest degree of oxidation obtainable. Mr. Stoddart emphasized the importance of using non-destructible clinker.

In reply to Mr. Waterfall, Mr. Dibdin stated that there was no treatment of the sewage previous to its flow on to the slate beds, except by means of a grit tank.

DR. TUBB THOMAS referred to the necessity of avoiding previous treatment of the sewage, and stated that in his opinion any treatment in closed tanks was an absolute mistake—the sewage must be fresh.

THE MAYOR OF DEVIZES stated that they were very satisfied with the working of the slate beds as compared with the old precipitation process. The County Council had not had occasion to complain of the condition of the brook since its introduction.

DR. WAYLEN (Medical Officer of Health for Devizes) stated that the stream was very much improved since the slate beds had been introduced. He thought that the choking of the secondary filter beds was due to the softness of the filter beds, and suggested shingles. Soft beds became converted almost into mud.

MR. BILLINGHAM (Surveyor, Devizes) stated that the cost of precipitation had been reduced from £700 to £200 per annum by the slate beds, and that their only trouble had been due to the use of soft material. There were no complaints now. The capacity was based on six times the dry weather flow.

MR. DIBDIN, in reply, emphasized the importance of secondary and even tertiary treatment, and that slate beds deal with solids mainly, but also secondarily, with albuminous matters in solution. If the sewage was very dilute, slate beds would give an effluent up to the standard. In Boston, with eight percolation beds, they required fifty acres, whereas if slate beds were used, twenty-three acres would do the same work. Percolation beds increased suspended solids, whilst albuminous matters were reduced thirty-five to forty per cent. by slate beds.

At a recent examination at a West Ham elementary school, the children were asked what a medical officer of health had to do. These are some of the answers:—

He has to see the doctors of the borough do their work.

He has to see the dustbins emptied.

He has to find out if the milkman has put chalk in the milk or the grocer sand in the pepper. See that the factory chimneys don't pour out too much smoke.

To see that all waste matters are put on unoccupied ground.

Write to the decorators about the drains.

Look after burst water pipes.

See that everything we eat is in good condition. One child returned this striking answer: "He discovered the circulation of the blood."

THE PREVENTION OF CONSUMPTION, AND THE FIGHT AGAINST TUBERCULOSIS.

By T. ORME DUDFIELD, M.D.,
Medical Officer of Health, Kensington.

(From the Annual Report on the Health of the Royal Borough of Kensington, 1907.)

THE prevention of consumption engaged much public attention last year; especially, as we shall see later on, in Ireland, where the disease is relatively far more fatal than in England. Of the matters which occupy the thoughts of public health administrators, none exceeds this in importance, for the "great white plague," as consumption has been well called, whilst being the cause of a vast number of deaths—forty thousand yearly in England and Wales—is both preventable and curable. A cause of untold misery to its victims, and those dependent upon them, it involves an immense drain upon the rates for the relief of the sick, the support of widows and orphans, and otherwise. The question therefore is one of national concern, and all right-thinking persons must desire that no effort should be spared to stamp out so devastating a scourge.

As regards sanatorium provisions, much has been done by private enterprise to supply the needs of well-to-do persons, able to pay, and not a little by local authorities in different parts of the country. But hitherto nothing approaching a national system for coping with a national need has been evolved. Such a system for the benefit of the chargeable poor could be created by the classification of Poor Law institutions, and the setting apart of some of them in each county as refuges for advanced, incurable cases, so dangerous to the community, and of others, as hospitals, for the treatment of recent cases in the initial stages of the disease, when it admits of alleviation or cure. I do not know whether the adoption of this plan would necessitate an application to Parliament, or whether it may be within the competence of the Local Government Board; in any case, however, it would appear to be within their power as regards the Metropolitan District, by Section 5 of the Metropolitan Poor Act, 1867, which enables the Board "by order [to] direct that any building for the time being in use as a workhouse be, with such alterations as the Board think fit, used for [an] asylum [i.e., for sufferers from an infectious disease or otherwise], and thenceforth that building shall be for the common use of the district accordingly." But the simpler course would be for the Board to issue an order making Section 5 applicable to the case of poor persons suffering from consumption, who would then be legally admissible to the asylums of the Metropolitan Asylums Board. To enable the Asylums Board to admit non-chargeable persons, legislation would be required.

So much premised, I propose in what follows to submit some account of the state of the "fight" against consumption as now going on in the three kingdoms with an ever-increasing intensity which presages ultimate victory to the cause of humanity.

And, first, with respect to England, and as

regards the official aspect of the matter, this is the least satisfactory of all. The Local Government Board, though satisfied that pulmonary phthisis (or, as I shall for brevity hereinafter call it, consumption) is an infectious disease to which the provisions of the Hospital Isolation Act, 1893, are applicable,* and that an inmate of a Poor Law establishment in a late stage of the malady, with copious expectoration, being a danger to the community, may be lawfully detained by the guardians,† nevertheless are not yet satisfied that it is one to which compulsory notification is properly applicable, or that they should sanction the establishment of sanatoria for poor inhabitants of London by the only body that could under present conditions undertake the duty—to wit, the Metropolitan Asylums Board—the only ground of objection alleged being the expense it would entail.‡

THE WORKERS' SANATORIUM.

When we pass to the region of private effort the prospect is more hopeful, and last year I had to chronicle a very notable event—the opening of the first sanatorium erected by the National Association for the Establishment and Maintenance of Sanatoria for workers suffering from Tuberculosis. The ceremony was performed on April 30th by Princess Christian, the president of the association, her Royal Highness having laid the foundation stone in July, 1906. The sanatorium, at Benenden, in the county of Kent, is designed for 200 patients; the part opened provides for about forty. The cost of the site (£5,800 for some 250 acres), and of the buildings which are of a permanent description (£20,000 = £100 per bed) has been defrayed by voluntary subscriptions; the maintenance of the patients will be undertaken by the friendly societies, who have not only guaranteed expenses by endowing beds at a cost of 25s. per week each, but will also hand over the members' sick pay for the support of wives and families, and thus will "overcome the anxiety of working men to leave the institution before complete arrest of their malady." A notable part of the scheme is an "after-care farm colony."

The claims of the association which has undertaken this great work were advocated at a public dinner on the 14th May, at which the Prince of Wales took the chair. His Royal Highness, in the course of his speech, explained the position of the societies. They can, he said, legally maintain beds in sanatoria, but cannot draw upon their capital for building purposes. If the new Institution proved to be a financial, as well as an educational success, inducement would be given to form branches of the Association around London, and in different parts of the country. The after-care farm colony was an important department of the sanatorium, enabling the patient to be gradually hardened so that he may resume full work on his discharge, with the least risk of another breakdown in health. The work-

* Letter from Local Government Board to the late Sir William Broadbent.

† Letter from Local Government Board to the Bath Union Board of Guardians.

‡ Letter from Local Government Board to the Metropolitan Asylums Board.

ing man was paying for his own cure and so rendering himself independent of charity. There were less than a thousand beds in the country for the open-air treatment of working-class sufferers, yet the fatality among the fifteen millions who were members of the friendly societies and the trade unions, was upwards of 28,000 lives per year, from the disease which slowly sapped the vitality of the breadwinner; its victims in London alone being counted by thousands. Tuberculosis was a greater disaster to the national life than any war, for it caused a perennial loss. Moreover, it robbed the sufferer of his means of living; it was estimated that the working classes of London lost annually four millions in wages from this terrible scourge, which entailed misery in thousands of homes, and brought, too often, the individual sufferer to end his days in abject poverty. His Royal Highness, acclaiming the "high ideals of this great enterprise," declared that he had "never pleaded for a cause more noble and more righteous."

This very interesting occurrence recalled to mind the abortive efforts of the Kensington Council and other public health authorities (1901-1905), to bring about the establishment of metropolitan sanatoria for poor persons suffering from consumption, and there having been reason in May, 1907, for thinking that those efforts, suspended two years before, might then be renewed with more prospect of success, a résumé of former proceedings was given under several headings.

ACTION OF THE POOR LAW AUTHORITIES.

The first step was taken, on the initiative of the managers of the Poplar Sick Asylum District, who, in 1900, sought authority from the Local Government Board to provide for the open-air treatment of chargeable sufferers from consumption. The Board were of opinion that if work of this sort were to be undertaken, it should be by a metropolitan authority, and for the whole of the metropolis; they suggested, therefore, the convening of a conference of the Boards of Guardians for consideration of the question. The conference was held in October, 1900, no fewer than seventy-seven delegates, representing twenty-six out of the thirty-two Poor Law Authorities being present. Perhaps the most significant incident was a speech by the chief medical inspector for Poor Law purposes of the Local Government Board (present unofficially), who, premising that in July, 1899, there were upwards of 1,500 consumptives in the metropolitan workhouse infirmaries, etc., of whom 400 were in the early stage of the disease, said that if sanatoria should be provided by the guardians, and he was favourable to it being done, they should be made available not only for the chargeable poor, but also "for that class above the very poor who were not able to pay for sanatorium treatment." Chargeable patients not likely to recover (he added), should be sent to institutions where facilities could be given for their friends to visit them. As an outcome of this pronouncement, provision has since been made for these hapless sufferers; some 1,500 beds, in separate wards (including eighty-five in Kensington), having been

allocated to their use at the Poor Law infirmaries. The conference, by a unanimous vote, expressed the opinion that "the time had come when provision should be made for the open-air treatment of consumption"; and "recommended the matter to the consideration of the Local Government Board, with a view to the necessary steps being taken for the carrying out of the proposal." The resolution was transmitted to the Board, who intimated that it, together with other communications of a similar nature, would receive their consideration.

ACTION OF THE PUBLIC HEALTH AUTHORITIES.

At one time or another, since 1901, the Borough Councils, with a very few (neutral) exceptions have addressed communications to the Local Government Board intimating their desire that the Metropolitan Asylums Board should be constituted sanatorium authority, with power to utilize their superfluous hospital accommodation for sanatorium purposes. Formal acknowledgments only were received from Whitehall; but the Managers of the Asylums Board manifested, from time to time, considerable interest in the proposal*, and in November, 1902, they signified their willingness to entertain the request that they should become the sanatorium authority for London, on an assurance being forthcoming that there was a "general consensus of opinion among the local authorities" that they should do so; further consideration of the subject, meantime, being adjourned for twelve months.

It was anticipated that the desired "general consensus of opinion" having been attained, the Managers, on further consideration of the subject, in November, 1903, would have applied to the Local Government Board for the necessary powers; but whilst recognising the "vital and far-reaching importance of the proposal to the community at large," they then resolved to "take no further steps in regard to it," without an "authoritative expression of opinion by the chief health authority of the country, the Local Government Board."† This decision was communicated to the Board, and to the local authorities, in December, 1903. The Board did not at that time disclose their views in regard to the matter.

The public health authorities continued their efforts; and at a conference of the representatives of the borough councils, convened by the County Council, for the consideration of the Administration of the Public Health (London) Act, 1891, held at the County Hall, in July, 1904, the subjoined resolution was unanimously adopted:—

"That it is desirable to make provision of sanatoria for the isolation and treatment of persons suffering from consumption, for the metropolis, as a whole, and under

* The Managers, it may here be mentioned, have assented to the principal involved in the proposal, by establishing (with the sanction of the Local Government Board) homes at Rustington and Margate, for the treatment of children—i.e., persons under sixteen years of age, suffering from tuberculosis; medical and surgical cases respectively.

† The immediate occasion of this resolution was the receipt of a letter from the Local Government Board, asking to be "furnished with the Managers' observations on a suggestion, made by the Poplar Board of Guardians, that the Asylums Board be authorized to establish sanatoria for the treatment of persons suffering from phthisis, who are chargeable to the metropolitan unions and parishes." The Managers did not reply directly to this request, nor did the Local Government Board afford them the desired "authoritative expression" of their views on the subject.

one authority; and that, in the opinion of this conference, the Metropolitan Asylums Board shall be such authority."

By desire of the conference the resolution was forwarded by the County Council to the Local Government Board, with a request that the matter might receive their immediate attention.

The views of the conference were in harmony with those of the Society of Medical Officers of Health (Metropolitan Branch), who, by an unanimous vote in October, 1903, had adopted a resolution to the effect that:—

"By reason of practical experience in regard to provision of hospitals, and the treatment of the infectious sick, the Asylums Board were eminently qualified for the discharge of the duty [of sanatorium authority], the effective performance of which, by any competent authority, could not fail to be attended with great advantages in the interests of public health."

In 1904 increased attention was being given to the question, and the Council of the Charity Organisation Society honoured me with an invitation to read a paper on "The Need of Sanatoria for Persons suffering from Consumption, and How it may be Supplied."

The discussion which followed the reading of this paper led to important results, having determined the Society of Medical Officers of Health (Metropolitan Branch) to memorialize the Asylums Board to give effect to their views, and the views of the great majority of the public health and Poor Law authorities, on the subject.

The memorial was presented to the Managers in April, 1905, the honour of representing the Metropolitan Medical Officers of Health having devolved on me. Speeches in support of the prayer were made by the Chairman of the Council of the National Association for the Prevention of Consumption (the late Sir William Broadbent), and the delegates of the Hospital Sunday Fund (Sir E. Hay Currie), and the Hospital Saturday Fund (Mr. W. G. Bunn). The Society was honoured on the occasion by the presence of representatives of The Royal Institute of Public Health, The Royal Sanitary Institute, and the National Health Society. The Chairman of the Board, in a sympathetic reply, acknowledged the importance of the matter, and the influential character of the deputation. A shorthand note of the proceedings was widely circulated by the Managers, who desired to elicit the views of the public health and Poor Law authorities on the question.

The memorial was referred to the general purposes committee, and forwarded subsequently to the Local Government Board, by whom in June, 1905, the Managers were informed that they were "obtaining information on the whole subject," and "were not then in a position to express an opinion on the question as to whether the Managers should undertake the new duties suggested."

Views of International Congresses and of Local Government Boards.—It may not be out of place here to mention that the International Congress on Tuberculosis, held in London, in 1901, declared sanatoria to be "an indispensable part of the measures necessary for the diminution of tuberculosis"; similar testimony was borne by the

congress held in Paris in 1905, and by the Local Government Board for Scotland, in 1906. At an earlier date the Local Government Board for Ireland had striven, by every available means, to induce the boards of guardians to provide separate accommodation for the isolation of consumptives, which one half of them are stated to have done.

Official Action.—The Poor Law inspectors of the Local Government Board for England, moreover, lose no opportunity for impressing on boards of guardians the need for isolation of consumptives; and rightly so, seeing that the Board, in 1903, informed the National Association for the Prevention of Consumption, that phthisis comes within the definition of an "infectious disease," and that provision may be made for persons suffering therefrom under the Isolation Hospitals Act, 1893—an Act "for enabling County Councils" (other than the London County Council, as the Act does not apply to London) "to promote the establishment of hospitals for the reception of patients suffering from infectious diseases"—a duty which, in the metropolis, was devolved upon the Asylums Board, by the Metropolitan Poor Act, 1867. The Board added that "although pulmonary tuberculosis is not one of the diseases [named], the provisions of the Act may, under section 26, be applied to that disease," by an order of the County Council, which, however, requires the approval of the Board.* In July, 1905, moreover, the Board, in response to an inquiry made by the Board of Guardians of the Bath Union, informed that body that they would be justified in compulsorily detaining a person suffering from consumption, attended with copious expectoration—for the reason that he would be in a condition to spread this infectious disease.

The Asylums Board's Decision.—In February, 1906, the General Purposes Committee of the Asylums Board reported on the reference of April, 1905, and, "in the absence of any authoritative expression of opinion by the Local Government Board, and as a result of [their] consideration of the question in all its bearings," [they] recommended—

"That the Managers do forward to the Local Government Board a copy of the memorial addressed to the Managers by the Metropolitan Branch of the Incorporated Society of Medical Officers of Health on the 15th April, 1905 . . . on the subject of the provision of hospital accommodation for the treatment and isolation of patients suffering from pulmonary phthisis"; and

"That the Local Government Board be further informed that, having regard to the uncertainty which prevails as to the probable number of patients who would come under the scheme referred to in the memorial, and to the great prospective cost to the ratepayers of the metropolis, the Managers would be glad to receive the judgment of the Local Government Board upon the prayer of the memorial referred to."

The report was adopted.

The Local Government Board's Decision.—In March, 1906, the long awaited decision of the Local Government Board was received; it informed the Managers that the subject [of the suggested establishment by them of sanatoria for the

* The Board's letter was published in the issue of *The Times* for May 23rd, 1903.

treatment of patients suffering from phthisis] "has received much careful consideration on the part of the Board, but that the information before them at present does not appear to afford sufficient justification for the very heavy outlay which would be involved in the proposal."

The accumulated experience of years, and the expression of the views of Congresses, of public health authorities, and of experts like Koch and others scarcely less eminent, as to the value of sanatoria had not sufficed to raise the question to a higher level than one of monetary consideration—a consideration which, nevertheless, might be pleaded as an overwhelming justification for the establishment of sanatoria, having regard to the cost of consumption to the community through the loss of wages (to mention no other source of loss) adverted to by the Prince of Wales.

Other cities, only less important than London—Liverpool, Birmingham, Edinburgh, Glasgow, Dublin—recognise the value of the open-air treatment, and have provided, or decided to provide, sanatoria. How great the need of London is may be established by a statement of the fatality of tuberculosis in 1906. The total deaths registered were 6,908, including 6,775 from pulmonary phthisis alone; and of these latter, no fewer than 5,583 (82.4 per cent. of the entire number) were of persons between the ages of twenty and sixty years, the best working period of life; the majority of them, moreover, being of the male sex, the bread winners.

THE SOUTHERN HOSPITAL.

When urging the allocation of the Gore Farm hospitals to sanatorium purposes in 1902, I referred also to the "Southern Hospital" which the managers of the Asylums Board had decided to erect at Carshalton for convalescent fever and diphtheria patients. From what I knew of the principle on which that hospital was designed, I expressed the opinion that it would be well suited for use as a sanatorium. It was handed over to the Board by the builders in the autumn of 1906; and in November a special committee was appointed "to consider and submit a report as to the best use to which [it] can be put." The report, submitted April 27th, 1907, was to the effect that the hospital was "not required for the present"; the committee therefore discussed the question "whether it was desirable or expedient to use the hospital for any other purpose?" In this connection, they said, three (but really only two) "alternatives" had been suggested. The second of these need not detain us; it was "to make use of the hospital as an industrial home for the treatment and training of sane epileptics and feeble-minded cases." The first alternative suggested was: "To make use of the buildings for the treatment of patients suffering from consumption" (the italics are mine), "allocating a certain number of beds to each of the metropolitan parishes and unions in proportion to their respective populations;" but, for what does not seem a very cogent reason, the committee did "not consider that the time [was] ripe for the Managers to come to a definite decision on the subject." They therefore

recommended a third "alternative," namely, "to keep the hospital unoccupied for a further twelve months, and then reconsider the whole question";* and they asked the Managers to adopt the following recommendation:—

"That inasmuch as the accommodation already provided by the Board in their acute and convalescent hospitals is sufficient for their present purposes, and is likely to be sufficient for the needs of the metropolis for some time to come, the Managers are of opinion that the Southern Hospital is not now required for fever hospital purposes."

The recommendation, moved by the chairman of the committee (who is now chairman of the Board), was adopted.

The "twelve months" have expired, but reconsideration of the question of the use to which the hospital should be put has not been resumed. Possibly it may be by the new Board.

The Movement in Ireland.—In 1901, and again in 1903, the Local Government Board for Ireland, by the circulation of advisory letters, posters, and leaflets, impressed upon the boards of guardians, and all others whom it concerned, the necessity of isolation for persons suffering from consumption, and their annual report for 1906 describes a "systematic plan consisting of four elements," on which, "in the opinion of the Board's medical department, the prevention of consumption should be dealt with." It may be summarised as follows: viz.—(1) By segregation of advanced cases in hospitals; (2) By provision of sanatoria for the treatment of the disease in an incipient stage; (3) By establishment of tuberculosis dispensaries, for advice and treatment, in large centres of population; and (4) By the appointment, by sanitary authorities, of local educative committees, and the circulation of leaflets, etc., relating to the disease.

Last year important measures were taken for supplementing official action; a "Tuberculosis Exhibition" was opened at Dublin (in October) by the Lord Lieutenant, who was accompanied by the

* An ineffectual effort was made in July to get the question of the use of the hospital reopened by a motion to rescind the resolution. More success attended a further effort on November 9th, when the following notes of motion were considered:—

"That the Board's resolution of April 27th, 1907, deferring for twelve months further consideration of the question of the purpose to which the Southern Hospital should be applied, be, and is hereby, rescinded."

"That, subject to the sanction of the Local Government Board, the Southern Hospital be opened for the accommodation and treatment of consumptive cases in the early stages, chargeable to the metropolitan boards of guardians."

The first motion was carried by thirty-eight votes to three, the Managers being thus set free to consider the "purpose to which this hospital should be applied."

Consideration of the second motion was deferred until November 23rd, when an amendment to it was moved as follows:—

"That, inasmuch as the Local Government Board, in their letter of March 22nd, 1906, on the subject of the proposed establishment by the Managers of sanatoria for the treatment of consumptive patients, stated definitely that the information then before them did 'not appear to afford sufficient justification for the very heavy outlay which would be involved in the proposal,' the Managers are not prepared to sanction the use of the Southern, or any other, hospital for the accommodation and treatment of patients of this class."

After a long debate the amendment was defeated on a show of hands by 28 votes to 24, and on a division by 33 to 23.

A second amendment was moved, and carried, to the effect:—

"That, in the absence of instructions from the Local Government Board in reply to the Managers' last communication on the subject of the provision of accommodation for tuberculous patients, this Board cannot see their way, at present, to take any useful action."

On the amendment being put as a substantive motion, a further amendment, to omit the words "at present," was carried by 34 votes to 24, and the motion, as amended by the omission of those words, was adopted.

The "last communication" of the Managers to the Local Government Board, mentioned in the second amendment, was based on a report (February 17th, 1903) of the General Purposes Committee (i.e., the Board sitting in committee), to whom the memorial of the London Medical Officers of Health had been referred.

Chief Secretary; many eminent members of the medical profession and other distinguished persons from various parts of Ireland being present. The exhibition, which had for its object spread of knowledge of the means for bringing about arrest of the progress of consumption, was promoted by Lady Aberdeen, as President of the Women's National Association of Ireland, and was taken to various parts of the country, where lectures were delivered in connection with it. His Excellency, referring to the importance of improving the sanitary conditions and conveniences of the homes of the people, as a means for preventing the spread of consumption, stated that under the Labourers' Dwellings Acts, 20,000 cottages had been built in the last twenty years; and that, arising out of recent legislation, there were applications for an additional 50,000—a splendid opportunity being thus furnished for local authorities to grapple with an important part of the great problem of the tuberculosis plague. Among the subjects which interested King Edward, one to which he gave special attention was this question of consumption, and he read a message from His Majesty as follows:—

"I am commanded by the King to express his good wishes for the success of the Tuberculosis Exhibition, the first of the kind ever held in Great Britain and Ireland, on the occasion of its being opened by you to-day. His Majesty is greatly interested in the problem of checking the progress of this disease, and he trusts that the exhibition may be the means of attracting the attention of the public to the terrible ravages caused by this scourge, and to the efforts which are now being made to arrest its progress.—Knollys."

In connection with this interesting event, an address on "What the Public can do in the fight against Tuberculosis," was delivered by Dr. William Osler, F.R.S., Regius Professor of Medicine at Oxford, his Excellency the Lord Lieutenant presiding. The lecturer emphasised the necessity for compulsory notification of consumption—"the only possible way to get at the disease being to know where it was," the provision of separate wards for isolation of advanced cases, and of sanatoria for recent cases. He referred to the victory achieved by medical science in the abolition of typhus fever, the scourge of Ireland in former days, and predicted that, if proper measures were adopted, the far more terrible scourge of tuberculosis—the cause of nearly one-sixth of the deaths in Ireland in 1904—would in one or two generations be in like manner exterminated.*

Subsequently the "Consultation Committee," formed by Lady Aberdeen, held a meeting, her Excellency presiding, and delegates from all parts of Ireland being present, when a resolution was adopted urging the need for powers enabling the county councils to erect and maintain hospitals, sanatoria, and dispensaries for the treatment of consumptives. The Chief Secretary, moreover, received a deputation from the County Councils' General Council, which laid before him the views of that body as to the measures which the Government should take for dealing with the problem of

* An abstract of the address was published in the *British Medical Journal*, October 19th, 1907.

tuberculosis. Mr. Birrell, in reply, said, in effect, that the time had come when all right-minded people must do all in their power to combat consumption. Sanatoria were to be established in Belfast, Cork and Dublin. There was a considerable number of workhouses occupying healthy and isolated sites which might be utilised for sanatorium purposes, and he would suggest to the Local Government Board that they should ascertain what workhouses, no longer needed as such, might be so utilised. It was eminently desirable, moreover, that there should be a statutory obligation on medical men to notify consumption, and he would base a representation to the Treasury for assistance, on the necessities of the situation, and the urgency of destroying this dreadful disease, which, if allowed to continue at the present rate, would reduce Ireland to a very awful condition. He thought that a measure authorising the erection of sanatoria, and providing for notification would have to be introduced in the next Session of Parliament, and he hoped that, with the aid of all gentlemen of position in Ireland, they might soon be able to begin the campaign against the shocking state of affairs.

[A Bill has been drafted to give effect to these views, and is to be introduced into the House of Commons during the current Session.]

The Movement in Scotland.—The Local Government Board for Scotland, in March, 1906, issued a circular to local authorities on the "Administrative Control of Pulmonary Phthisis," in which they dealt with the necessity for provision of sanatoria, and announced their willingness to give favourable consideration to any application for their approval to compulsory notification, provided they were satisfied that the local authority making it were in a position, and were ready, to deal effectively with the cases notified to them; i.e., by provision of sanatorium accommodation for isolation and treatment of sufferers in the different stages of the disease. In their annual report for 1906, the Board refer to various gratifying results consequent upon the issue of the circular—including sanatorium provision by local authorities, and the giving of their approval to applications for compulsory notification powers. With reference to this circular the Board observe that—

"The most important point to which the attention of the Local Authorities was directed, was that 'pulmonary phthisis (that is tuberculosis of the lungs or consumption) is an infectious disease within the meaning of the Public Health (Scotland) Act, 1897;' and that 'the sections of that Act applicable to other infectious diseases are equally applicable to pulmonary phthisis, and the obligation resting on the Local Authority to deal with and control infectious diseases extends to pulmonary phthisis.' For the effective application of the Public Health Act to pulmonary phthisis, it was pointed out that a system of notification is essential."

COMPULSORY NOTIFICATION OF CONSUMPTION.

The views of the several Local Government Boards on the subject of compulsory notification differ somewhat widely. The Local Government Board for Scotland are favourable to the practice, and in a communication I had the honour of

receiving from them in November it was stated:—(1) That the local authorities of the burghs of Edinburgh, Brechin, and Pennicuik have, with the Board's approval, extended the Infectious Disease (Notification Act), 1889, permanently to include pulmonary phthisis; (2) that the local authority of the Lower Ward District of Lanarkshire have extended the Act for five years; and (3) that the Cupar Burgh and the Linlithgow and Bathgate Districts of the County of Linlithgow have also extended the Act for the period of five years. Nothing to the contrary being said, it is to be presumed that the provisions of the notification sections are applicable in their entirety; but no doubt the local authorities are exercising their powers with discretion.

The view of the Local Government Board for Ireland on the subject as explained in a communication I had the honour of receiving from them, also in November last, is that notification "should be carried out by special legislation, and that safeguards should be provided to ensure that no unnecessary restraint is placed on the liberty of consumptive patients. If notification is used merely for the purpose of gaining information as to the locality of the disease, and helping the sufferer by giving assistance and advice which would be useful in protecting other members of his family from contracting the disease, they consider that it would, under efficient and sympathetic administration, be a most useful public health measure."

To this it may be added that, at the meeting of the "Consultation Committee" at Dublin above referred to, at which her Excellency the Countess of Aberdeen presided, delegates from all parts of Ireland being present, the following resolution was adopted:—

"That it is desirable that the Government should, without delay, introduce special legislation with the object of making it compulsory to notify all cases of pulmonary tuberculosis, taking care at the same time to protect consumptive patients from any undue interference with their liberty."

And, as we have seen, not only did the Chief Secretary, when receiving a deputation, assent to this view, but he has prepared a Bill to provide for the compulsory notification of consumption, which he hopes to carry during the present Session.

In England the opinion that, in order to be effective, notification of consumption must be compulsory seems to be gathering force. The conference of delegates of the metropolitan sanitary authorities, held at the County Hall, in July, 1904, passed a resolution in favour of compulsory notification, as did the representatives of the borough councils at the conference convened by the Paddington Council, and held in June last. This view, however, is not yet accepted by the Local Government Board, who some time since, in response to an application from the Barnstaple Rural District Council, urging that pulmonary phthisis should be included amongst the list of notifiable diseases, intimated that it was not a disease to which compulsory notification could, with advantage, be applied.

PRESERVATIVES IN MEAT.*

THE Local Government Board have recently issued a valuable report by Dr. A. W. J. MacFadden, on "Preservatives in Canned and Glass-packed Meats of Home and Foreign Origin." This report is one of the results of the "Jungle" scare in 1906. In the summer and autumn of that year a large number of samples of canned and glass-packed meats were analysed by public analysts in this country, and of the 1,733 samples reported upon, no fewer than 333, or over 19 per cent., were found to contain chemical preservatives other than salt and saltpetre. Of these preservatives, 243 were boron compounds, forming 14 per cent. of the whole, while in the remaining 90 samples, the presence of sulphite preservatives was reported. In view of these results, the Board decided to inquire into the circumstances that lead to the presence of preservatives in this class of food, and Dr. MacFadden was instructed to make the necessary investigations.

The United States Meat Inspection Act, which came into force on October 1st, 1906, provides that no meat or meat-food product intended for consumption in the United States shall contain "any substance which lessens its wholesomeness, or any drug, chemical, harmful dye, or preservative, other than the preservatives common salt, sugar, wood smoke, vinegar, pure spices, and, pending further inquiry, saltpetre." But it also provides that "in accordance with the directions of the foreign purchaser or his agent, meats and meat-food products prepared for export may contain preservatives in proportions which do not conflict with the laws of the foreign country to which they are to be exported." In other words, the United States Government does not prevent the exportation of preserved meats to those countries that allow their inhabitants to consume such meats.

Dr. MacFadden was informed by the London representatives of United States packing houses that it had never been the practice of American packers to add preservatives to meat for canning purposes, and that under the new Act it would not pay to do so; "for not only would separate canning plants have to be established for this purpose, but the entire output of such plants would have to be ear-marked for export

* Report by Dr. A. W. J. MacFadden to the Local Government Board, on "Preservatives in Canned and Glass-packed Meats of Home and Foreign Origin, with Observations on the Manufacture of such Meats." Price 4d.

only, an arrangement which would hamper American trade operations by cutting off foreign markets as a relief in times of surplus, and by rendering stock intended for those markets unavailable in times of shortage in the United States." The results of the analyses made in 1906 show, however, that in that year a considerable proportion of American canned meats contained preservatives, although for the most part these were present in small quantities. Dr. Macfadden gives the following Table:—

Table showing number of cases in which preservatives were reported in samples of canned meats manufactured by five different firms of United States packers.

Variety of Canned Meats.	Total Samples examined.	Preservatives.	
		Boron.	Sulphites.
Corned Beef ...	264	22	17
Tongues ...	91	11	4
*Prepared meats ...	82	8	7
†Fresh meats ...	67	4	3
Potted meats ...	57	1	5
Soups ...	14	1	1
Total ...	575	47	37

* Brawns, meat loaves, minced steak, canned sausage, &c.

† Roast beef, roast mutton, chicken, &c.

Presence of Preservatives in Raw Materials.—A large quantity of meat products are imported into this country which are largely used in the preparation of British-made canned and glass-packed meats. The great bulk of preserved meat of this kind is imported from the United States, and Dr. MacFadden points out that—

In dealing with meat products treated with preservatives which come to this country from the United States, it should be remembered that the Meat Inspection Act and regulations referred to in the preceding section, apply equally to these and to all other American meat food products. But the practice of United States packers and of British importers regarding the class of materials dealt with in this section, varies in important respects from that which has been indicated in the case of imported canned meats.

From inquiries which I have made, it would seem that in the preparation for export of a large section of these products, advantage is now taken of that part of the Meat Inspection Act which allows of the use of preservatives in goods intended for exportation, provided the laws of the country for which they are destined, permit of the use of preservatives in this way. Thus at the present date the following articles may still be treated with preservatives* for shipment to British markets in

* Cf. Dr. G. S. Buchanan's Report to the Local Government Board on certain Imported Meat Foods of questionable wholesomeness.—Reports of Inspector of Foods, No. 8.

the same way as was the custom before the passing of the Meat Inspection Act, namely:—

Chopped sausage meat.

Kidneys in kegs.

Pigs' and other tongues in barrels.

Cooked tripe in kegs.

Uncooked tripe in barrels.

In addition to the above, the following products, if not actually treated with boron compounds during their preparation, are, at any rate, packed in boron preservatives for shipment to the United Kingdom, and are liable to contain more or less preservatives in their substance on this account. These are:—

Green hams.

Green bacon.

These include the greater proportion of American hams and bacon entering British markets.

With the possible exception of the two kinds of tripe mentioned, all the other products named in the first list, are liable to be used by canners of one sort or another in this country. The objectionable nature of these food materials has already been dealt with fully in the report just referred to, and beyond stating the fact that their preservation during transit and for a more or less protracted period of storage in this country, is dependent entirely on the solutions of boron or other preservative in which they are placed, it will be unnecessary to refer to them in greater detail here.

Boric Acid in Hams and Bacon.—American hams and bacon, which are largely utilized by home canners in the preparation of various kinds of potted meats, arrive in this country packed in boxes, usually containing about 5 cwt. The hams, &c., are packed between thin layers of powdered borax in such a way as to be covered completely by the preservative. Cold storage is not required for the transport of these products when packed in this way, and they may be stored on landing in ordinary warehouses. American hams and bacon are generally shipped to this country in what is known as the "green" state, that is to say, they have simply been subjected to the preliminary process of pickling by one or another method, and have not been hung, smoked or otherwise finished for sale. The latter operations are carried out in the case of these American products by bacon and ham curers in this country. I understand that in the case of bacon and hams, American packers employ one or two different processes of curing preliminary to the despatch of these goods. One is known as "dry curing," and I am told that in this process, salt and saltpetre alone are used, without any other preservatives. This I understand is the method employed by some Chicago firms, who make a speciality of the trade in "English cut" hams and bacon. The other is known as the "sweet pickle" method, in which the hams are steeped for a period of about four weeks in a liquid containing salt, saltpetre and sugar. I was informed by a director of a large association of American packers that rapid pickling by injection of fluid under pressure into the substance of the meat, as practised in Denmark, is not employed in

the United States. He told me also that previous to the passing of the new law, 1 per cent. of boric acid was nearly always added to pickle for the purpose of keeping it and its contents from "souring," but that since the new law came into force the addition of boric acid to pickling fluids had been discontinued in all cases, including pickle used for the preparation of goods intended for export. It would not, he said, pay the packers to make a distinction of this kind between hams and bacon intended for the American home market and those for export, as this would involve the provision of a separate plant for the latter, besides ear-marking such products for one definite destination several weeks before a demand for them had arisen.

It is stated to be only in the treatment after curing, i.e., in the packing, that a distinction is made between products intended for inter-state trade and those required for immediate export to British markets. The practice, which has been in existence now for many years, is to pack the latter in borax preservative, which will act as a surface protective and prevent the meat from becoming tainted while in transit. This method of transporting hams and bacon is regarded by importers as being of vital importance to the trade in these materials—green hams and bacon are, after all, little more than pork and are readily perishable articles. The use of cold transport as a substitute has, they say, been found impracticable and excessively costly so far as it has been tried, and the old method of packing in salt is declared to be incompatible with the modern taste for mild cured, i.e., comparatively saltless, bacon and hams.

The method of packing hams and bacon above referred to is carried out in the following way: After the meat has been removed from the pickling tanks or dry salting rooms, that which is required for export is removed to the separate building where packing in preservative for this purpose is conducted. It is there dried, powdered with borax, and packed in wooden cases, an extra sprinkling of the preservative being placed between each layer of meat. I am told that from four to five pounds of borax are used to each case of 560 pounds, i.e., somewhat less than 1 per cent. by weight of the meat. I also learn that about three and a half pounds of the preservative is generally removed from the contents of each case when they are unpacked in this country. This would leave from half a pound to one and a half pounds of the preservative originally added to be accounted for. In reality, however, this amount is more than the mere difference in weight would indicate, for when the preservative is added it is in the form of dry powder, but by the end of the three or four weeks during which the case has been in transit, the powder will have absorbed a certain amount of moisture from the meat and will generally then be found in the form of a cake or paste in which the relative proportion of actual borax would probably be much less than in the original powder.

Dr. MacFadden discusses the important question of the penetrative power of preservatives when used as packing material. For

this report some interesting experiments were made by Mr. P. A. Ellis Richards, F.I.C., and Dr. MacFadden points out that—

The results obtained by Mr. Richards confirm the view that boric acid, which has been in contact with hams for a period of three or four weeks or more, does actually penetrate their substance to a very considerable degree, and disposes of the contention put forward by some of those engaged in the trade that penetration beyond the surface, except to the very smallest extent, does not occur in these circumstances. It disposes also of the further statement that any boric acid which might be present in the surface layers of the meat as a result of contact with packing materials, can easily be removed by washing and brushing in the ordinary way. Reference to Mr. Richards' report will show that all the sample hams dealt with were washed and brushed in this way before chemical examination was made, and that notwithstanding this treatment there were found in the skin covering the fat as much as from 13 to 24 grains of boric acid per pound, and in the outer half inch of the lean side of the hams, amounts varying from 19 to 45 grains per pound. Even after boiling in the way ordinarily employed in the kitchen, large amounts of boric acid were still observed to be present in the outer layers of the lean portions of two hams.

Below the surface layers and throughout the entire mass of the meat the preservative was demonstrated in varying quantities in every sample in which borax had been used for packing. In some, quite considerable amounts were found as far as from two to three inches from the surface, and even in the most remote parts of the muscular substance quantities varying from 2 to 15 grains per pound were noted.

The small amount of penetration which was observed in the large mass of fat forming the upper portion of the hams is worthy of note. The quantity of boric acid found in this situation was in all cases fairly constant, but in none did it reach as much as two grains per pound, notwithstanding the fact that the tissues in immediate contact with it, namely, the skin and muscle substance, showed a much greater proportion of the preservative.

Muscular tissue on the other hand appears to be liable to somewhat extensive penetration by boron compounds. The distribution of the preservative at various levels in the muscular substance, as set out under the heading "lean" in the table of analytical results, shows a fairly constant decrease in amount as the distance from the lean or lower surface of the ham increases. As the amount of boric acid in that part of the muscular substance immediately underlying the upper layer of fat is greater in every case than the amount in the fat itself, it seems probable that most of the boric acid found in the muscular tissue, which represents the bulk of the total boric acid found in the ham, is derived by penetration from the lean under surface.

It is probable that the amount of penetration which takes place in hams through contact with their borax packing, varies directly with the length

of time during which contact occurs. I have been informed by the firms which supplied the samples that the interval between packing and shipment was not likely in these instances to have been more than two or three days at the outside. It may be assumed from this and from the dates of shipment that the samples referred to in the Table under numbers 1 to 4 inclusive, had been packed in their cases for about four weeks at the time they were taken for analysis.

The process of cooking does not seem to reduce the boric acid contents to any very marked extent, judging by the figures obtained in samples 5B and 6B which were boiled previous to being examined.

The average amount of boric acid found in the edible portion of each ham, is shown in the last line of the table of analyses. The comparatively small quantities of the preservative found in samples of the minced and mixed fat and lean in each case, is due in great measure to the very small boric acid content of the fat, which forms so large a component of the total mass in most hams.

THE PRACTICE OF HOME MANUFACTURERS IN REGARD TO THE USE OF PRESERVATIVES IN CANNED AND GLASS-PACKED MEATS.

Dr. MacFadden gives the following Table, which shows the results obtained in the 1906 analyses with respect to the prevalence of preservatives in canned and hermetically sealed glass-packed goods of British manufacture.

Class.	Total Samples.	Preservatives.	
		Boron.	Sulphites.
Corned beef	9	3	—
Tongues	33	10	3
Potted meats, fish pastes, &c. ...	196	118	2
Prepared meats, brawn, &c., meat loaves, canned sausage, ham, minced steak	56	22	1
Fresh meats, rabbits, &c., roast beef, roast mutton	24	—	5
Soups, broths, meat extracts, &c. ...	11	2	1
Fish	23	1	—
Total	352	156	12

The above Table shows the large proportion of British samples taken in which preservatives were reported. The actual amounts estimated to have been present were in many instances also considerable. Thus of boric acid the amounts estimated were in 11 samples between 20 and 30 grains per pound, in 15 between 30 and 40 grains, in 5 between 40 and 50 grains. Nine samples contained larger quantities, viz., 55, 56, 71.5, 74.2, 91, 110, 114.5, 145.7, and 163.6 grains per pound respectively. In about 100 of the samples the amounts of boric acid estimated varied from a fraction of a grain up to 20 grains per pound, and in the remaining samples which were said to contain boric acid, either the amounts were not stated, or the preservative was reported to have been present in traces only. The remarks already made as to

the variability of methods and criteria for reporting, which are inevitable in a collected series such as this, must of course be borne in mind in considering these figures. It is possible that in the case of those analysts whose reports merely stated whether boric acid was or was not present, many of their samples may have contained considerable amounts; the significance of the term "trace" doubtless varied with different analysts. The results of the examinations show, nevertheless, that boric acid has been found present in canned meats of British origin in a large proportion of samples taken from many different localities, and that in several cases it has been reported to have been present in considerable amounts.

The British samples in which sulphite preservatives were reported were few in number compared with those which contained borates. Sulphites also occurred less frequently in British samples than in those of United States origin. Among the former it will be noticed from the above Table, that such meats as "tongues" and "fresh meats" were reported to contain this preservative more frequently than other British varieties of canned meat. This is in accordance with what has already been stated as to the use of sulphite sprays, &c., for revivifying meats in the joint or mass.

Dr. MacFadden gives much valuable information relating to the methods of manufacture of canned and glass-packed meats in this country. He describes the various processes of sterilization employed, and he points out that the sanitary condition of the premises on which these processes are carried out not infrequently leaves much to be desired. He concludes by directing attention to the following matters, which incidentally came into prominence during his inquiries:—

(a) *Proprietary Antiseptic Preparations.*—It seems desirable that manufacturers of meat foods should refuse to purchase any preparations offered to them for the purpose of treating meat in storage, or of adding to meat preparations or brines, unless they are fully assured as to the composition of any preparations so offered.

(b) *Labelling.*—So far as my inquiry has been concerned with the question of labelling and marking of canned foods, it has brought into prominence the fact that the custom which at present prevails in this matter in many cases does not permit the origin of particular tins of canned meats to be traced further than to the middleman or importer. In some cases (including to my knowledge at least one in which the wholesomeness of the foods was open to very serious question) neither the can nor the label bears any name or other mark by which it can be referred to retailer, middleman, manufacturer, or anyone at all. Reform in the trade custom in this respect seems on many grounds desirable.

(c) *Admixture of Starch with Potted Meats.*—Starch, usually in the form of rice flour, is sometimes present in such amounts in some kinds of potted meats that these may be thought to constitute a fraud on the consumer, notwithstand-

ing their cheap price. The matter seems worth the attention of better-class manufacturers with a view to arriving at a reasonable maximum limit of permissible starchy matter in specified canned foods of this class.

(d) *Preservatives in Sausages, etc.*—Some of the objections above set out to the use of chemical antiseptics in canned meats apply also to such articles as sausages, pork pies, mincemeats, brawns, and the like, which are not preserved by canning or cold storage, but in the ordinary course of trade may be kept for several days on the shop counter and similar places. If, on the ground of public convenience and trade requirements, the use of chemical antiseptics is permitted in these articles, it appears very desirable that their employment should be restricted within narrow limits. Quantities of boric acid are not seldom reported by public analysts in some of these goods which cannot be otherwise than prejudicial in themselves, besides being wholly unnecessary. If boron preparations are used for this purpose, a limit of $\frac{1}{4}$ per cent. of boric acid would probably be ample to meet legitimate trade requirements, and even in this case it appears desirable to consider whether notification of the presence of the preservatives should not be given to the purchaser. The practice of using solutions of sulphurous acid or sulphites as a spray or wash, or for mixing with the meat, appears to be open to many abuses, and to be generally undesirable.

(e) *Places where food is prepared.*—The Board have recently received representations from several sources to the effect that stricter sanitary supervision and control should be exercised by local authorities in this country over premises on which meat foods are manufactured, and over the processes of preparation employed on such premises. It has likewise been urged that all practicable steps should be taken to require evidence from official sources as to the inspection or supervision in foreign or colonial establishments whence meat foods are imported into the United Kingdom. The inquiries above recorded have brought out many circumstances which appear to support these views.

MILK.—At West Ham, on May 27th, Ernest Clarke, a milk dealer, of Plaistow, was summoned for selling milk not of the nature, substance and quality demanded. A lady, engaged by Dr. Sanders, medical officer of health, bought a pint of milk for 1½d., and when the inspector appeared the defendant's man said he had sold "separated" milk, and that "milk" was not asked for. The analysis of the sample sold showed that it was deficient of 50 per cent. of its fat, but two other samples sold—one as "pure milk" and the other as "separated milk"—were recorded as genuine. A further defence was that the milk was sold as received from the wholesale dealer, with whom the defendant had a contract and a warranty. Witnesses were called to prove that the milk had not been interfered with after its delivery. Mr. Gillespie said the warranty defence had failed, and he imposed a fine of £20, with the alternative of two months' imprisonment.

THE NEW ELEMENTARY EDUCATION CODE.*

IN the new Code, which comes into force on August 1st, 1908, the Board of Education have introduced alterations which are of considerable public health importance. These are of two kinds: (1) those relating to the medical inspection of school children; and (2) those relating to school hygiene generally. The former are clearly explained in the first section of the prefatory memorandum to the code, which is in the following terms:—

By Section 13 of the Education (Administrative Provisions) Act, 1907, it was provided that the powers and duties of a local education authority under Part III of the Education Act, 1902, "shall include . . . the duty to provide for the medical inspection of children immediately before or at the time of, or as soon as possible after, their admission to a public elementary school, and on such other occasions as the Board of Education direct, and the power to make such arrangements as may be sanctioned by the Board of Education for attending to the health and physical condition of the children educated in public elementary schools." This section came into operation on January 1st, 1908, and, in anticipation of that date, the Board issued on November 22nd, 1907, a memorandum (Circular 576) discussing the principles and methods in accordance with which it was, in their opinion, necessary or desirable that the duties of medical inspection should be performed by local education authorities. This memorandum was supplemented by a further circular (No. 582), in which specific directions were given for carrying out the work of medical inspection. In paragraph 10 of the first-mentioned circular, the Board stated that the effectiveness of medical inspection would "in future be one of the elements to be considered in determining the efficiency of each school as a grant-aided school." The Board have accordingly introduced into Article 25 (c) of the code a general provision giving effect to this announcement, and they have added a new article, numbered 58, providing that the managers shall give the local education authority all reasonable facilities for the purpose of medical inspection, and specifically requiring provision to be made for the inspection of all children admitted to the school since August 1st, 1908, and all children expected to leave school before July 31st, 1909. It must be understood that this requirement is made only in respect of the year commencing August 1st, 1908, and only for the purposes of the code. The Board have no intention of receding from the position taken up by them in paragraph 12 of Circular 576, nor of derogating from the statutory obligation imposed on local education authorities by Section 13 of the Act of 1907. The Board appreciate the efforts which have been made by many local

* Code of Regulations for Public Elementary Schools in England, 1908. Wyman & Sons. Price 3d.

education authorities to cope with the new duties imposed upon them, and they recognise that, in many cases, very satisfactory arrangements have been, or are being, made for the purpose. On the other hand, they are aware that considerable difficulties have been experienced by certain authorities in appointing the necessary officers and making the other arrangements required for the initiation of the work, and they have felt justified in making some concession to meet the difficulties experienced in these cases. Cases in which local authorities have made and are making no effort to comply with the requirements of the Act are altogether exceptional, and the Board hope that the number of cases in which it will be necessary to make a deduction from the grant payable in respect of any public elementary school under the new provisions of this code will be extremely few.

It will be observed that the Board have also introduced into the code provisions in Articles 43 (b) (footnote), 44 (h), 45 (b), and 53 (b), providing against loss of grant on account of any interruption to the school work caused by medical inspection, and provisions dealing with the closure of schools or the exclusion of children from school on medical grounds under the authority of the "School Medical Officer." This officer is defined in Article 44 (g) of the code as "a medical officer named by the local education authority and recognised as such by the Board." The chief school medical officer of a local education authority should, as a rule, be the person placed in charge of the work of medical inspection, and it is very desirable that he should either be the same person as the medical officer of health or be under his supervision or control.

It is obviously desirable that any arrangements made by a local education authority under the Education (Provision of Meals) Act, 1906, for providing meals for children in attendance at public elementary schools should be co-ordinated, as far as possible, with the arrangements for medical inspection under the Act of 1907, while at the same time the methods employed in the provision of meals should be not merely such as will secure an improvement in the physical condition of the children, but such as will have a directly educational effect upon them in respect of manners and conduct.

General Hygiene.—The regulations of the new code that relate to the health of the children, apart from medical inspection, are of various kinds. In the curriculum for infants it is provided that:—"Physical exercises should take the form of games involving free movement, singing and breathing exercises rather than set drill," and that although instruction in sewing and knitting may be given to the older infants "care must be taken to avoid fine work and injury to eyesight."

The curriculum for older scholars contains the following:—

9. *Hygiene and Physical Training*, including exercises in proper breathing; instruction

adapted to the ages and sexes of the scholars in the elementary rules of personal health, particularly in respect of food, drink (including alcohol), clothing, cleanliness, and fresh air; and careful cultivation of a correct posture at writing and other lessons. In any course of physical exercises the general physical development of the scholars should be aimed at, and the official syllabus of physical training should be followed. The scholars of any school not situated wholly on a ground floor should be practised in fire drill. Instruction and practice in swimming may also be included in the time table.

In chapter 3 of the code, which has reference to premises, accommodation and equipment, it is provided that:—

18. The premises of the school must be healthy, safe in case of fire, must have suitable and sufficient sanitary and cloak-room accommodation for the scholars in attendance and for teachers, must be adequately lighted, warmed, ventilated, cleaned and drained, must be kept in proper repair, and must be sufficient, convenient, and suitably arranged for the instruction of the children in attendance according to their age.

In the regulations relating to attendance, school meetings, etc., there are the following important provisions:—

44. In making up the minimum time required under Article 43 (b) in order that an attendance may be reckoned for grant there may be included:—

- (g) Any time spent during the ordinary school term under arrangements and according to a time table approved by the Board at an open-air school, school camp, or other place selected with a view to an improvement of the health and physical condition of the children.

The Board may at any time require the local education authority to furnish them with a special report by the school medical officer on the working and effect of any arrangements made under this Article.

For the purposes of this code "school medical officer" means a medical officer named by the local education authority, and recognised as such by the Board. In exceptional cases the Board will recognise separate school medical officers for separate parts of one area.

- (h) Any period occupied by a medical inspection of scholars conducted by or under the authority of the local education authority in pursuance of the requirements of Section 13 of the Education (Administrative Provisions) Act, 1907, whether such inspection is conducted in the school premises or (in special circumstances) in some other place appointed for the purpose by the local education authority with the approval of the Board.

45. The school or department must have met not less than 400 times in the school year.

* * * *

- (b) If the requisite number of meetings has not been held owing to a closure of the school under Article 57, or under the advice or with the approval of the school medical officer, or for any other unavoidable cause, the grant will be paid in full, provided that the requirements of this Article are satisfied after an allowance of nine meetings has been made for each week of such closure.

Exclusion from school is dealt with in Article 53, which is as follows:—

- 53 (a) No child may be refused admission to a public elementary school on other than reasonable grounds.

- (b) Where the Board are satisfied (i) that proper arrangements have been made by the local education authority for enabling the school medical officer to ascertain and certify cases in which the exclusion of children from school is desirable, and (ii) that the school medical officer has authorised the exclusion of certain children from the school

1. on the ground that their exclusion is desirable to prevent the spread of disease, or

2. on the ground that their uncleanly or verminous condition is detrimental to the other scholars, or

3. on the ground that, owing to their state of health or their physical or mental defects, they are incapable of receiving proper benefit from the instruction in the school, the exclusion of such children shall be deemed for the purposes of this code to be exclusion on reasonable grounds.

Every direction or authority given by the school medical officer must be embodied in a certificate signed by him. A copy of every certificate must be furnished to the local education authority and must be produced, if required, to any inspector or officer of the Board's medical department.

- (c) Where the local education authority have so determined in the case of any school maintained by them, children who are under five years of age may be refused admission to that school.

It will be noted that the above provisions confer powers of considerable importance upon the school medical officer.

Article 57, which provides for the closure of schools by the sanitary authority, remains unaltered, except that the appeal to the Board of Education has been withdrawn.

THE REGULATIONS FOR THE TRAINING OF TEACHERS FOR ELEMENTARY SCHOOLS.*

THESE regulations, which have recently been issued by the Board of Education, come into force on August 1st, 1908. They contain new provisions which are of much importance from the point of view of school hygiene, and these are explained in the following extracts from the Board's prefatory memorandum to the regulations.

There are two "special subjects" which are at the special moment becoming recognised on all hands as of vital importance in connection with the work of our elementary schools. Up till now no attempt, or at the best no systematic attempt, has been made to teach school hygiene and physical exercises to the majority of our 80,000 certificated teachers, during the years anterior to their obtaining their certificate as teachers, in a way that would have prepared them in this respect for their life's work. The Board have come to the conclusion, after an investigation of the provision at present made for each of these subjects, that it is necessary to require that adequate time and efficient instruction shall henceforward be given in both, in the case of (at least) all the two-year students admitted to any training college this year, other than students taking degree courses, and of all the one-year students and certificated students admitted in 1909. School hygiene and physical exercises are, therefore, now included in the ordinary course of study laid down for these students, and thus become compulsory for them, though still left optional for the other students.

It is accordingly in the hope of assisting in the establishment and general recognition of something like an adequate standard of efficiency in the teaching of hygiene that the Board have now substituted for the former optional syllabus, and for those portions of the syllabus in principles of teaching which had reference to hygiene, a new syllabus of hygiene of a comprehensive though elementary nature, which is intended to serve as a general guide to the teaching staffs of training colleges and to all "intending teachers," and as a model for any alternative syllabus which may be submitted by training colleges to the Board for approval. A special paper in hygiene will be included in the Board's final examination of students on completing their training college course. The Board have also included for the first time special syllabuses in hygiene and the principles of teaching for teachers of blind, deaf, or defective children. The Board desire to draw special attention to these various syllabuses concerning hygiene, not only on account of the extreme and obvious importance of the subject with which they deal, but because the successful administration of the Education (Administrative Provisions) Act, 1907, in the schools throughout the kingdom must

*Printed for His Majesty's Stationery Office by Wyman & Sons. Price 7d.

necessarily call for an intelligent appreciation on the part of a teacher of the elementary problems of hygiene, and the personal health of the children. What has aptly been called a "health conscience" is a necessary part of the equipment of a good teacher, and it is the development of that faculty which it is desired by the Board to secure, rather than the production of any sort or degree of "specialism." Anything in the nature of advanced technique or needless acquaintance with technical terms should, of course, be avoided. Nor is it suggested that the student's training in hygiene should be such as to allow of, or even suggest, his assuming the functions of the doctor. But, on the other hand, he should be able to appreciate the conditions, both mental and physical, which unfit a child for school work, and he should be able readily to notice when failure on the part of the child to acquit himself creditably is due not to unwillingness or lack of painstaking endeavour, but to some defect or incapacity over which the child has little or no control.

Students on completing their course of training, and taking up the work of teaching in elementary schools, should know enough elementary anatomy and physiology to understand the general structure and functions of the body. Particular attention should have been given in their course of training to the nervous system and special senses, in order that signs of backwardness and over-strain, the consequences of defective sight, hearing, etc., in the children may be appreciated by the teacher, who should be able to recognise also the early signs of the commoner infectious diseases of children; for much can be done to prevent the spread of epidemics by the timely detection and isolation of suspected cases. Further, the importance of physical exercise and rest should be clearly understood. The intending teacher should also have an adequate knowledge of the hygiene of the school, should understand the general conditions necessary for making a building or room healthy, and for keeping it so, and he or she should be well acquainted with the laws of personal health. In the case of women students the nutritive value of food-stuffs in relation to their cost in the market, and to the needs of young children, should be known in outline, even though the student may not be specially qualified in domestic economy. Only thus will they know how to conduct the school as a whole with the greatest profit to the health and bodily development of scholars, and how to adapt the instruction which they give, either in incidental teaching or by example, to the limitations which unhappily are not unfrequently imposed by the feeble health of children, or by the poverty or neglect of their parents.

It may, perhaps, be convenient to add that though the hygiene syllabus is arranged as twelve lectures, it is not intended that each lecture should necessarily be limited to one hour. It might be found convenient to arrange either for the course of lectures to take twelve hours with a practical class of one hour's duration in addition, or to extend the syllabus itself over a larger number of lessons up to twenty-four. It must be understood

that these lessons must not be mere lectures, unsupplemented by actual observation and practice, but that as far as possible students should be taught by practical demonstration how to appreciate the essential points in the hygiene of both children and schools. For this purpose they should be taken to visit selected schools, and their attention drawn to important points of sanitation and equipment, and suitable children should be observed in groups and individually. It is scarcely necessary to add that the syllabus has been constructed with the object of guiding the teaching staffs of the training colleges in so handling their students (whose age range is from seventeen or eighteen to twenty-two or thereabouts) as to give to each of them a practical and effective understanding of the principles of hygiene, and an adequate sense of its great importance; the syllabus is not in any way intended for use in teaching the subject to children, for whom it would obviously be unsuited.

As regards the second of the two subjects named above, viz., physical exercises, investigation has shown that very few of the men students who leave our training colleges each year have had any serious instruction in the principles on which the official syllabus of physical exercises for use in public elementary schools is based, and still less any effective practice in carrying out those exercises. Some of the women's colleges, on the other hand, have treated this matter with more seriousness. As in the case of hygiene, the condition of things as regards students reading for degrees makes it impossible at present to insist that proper time should in their case be given to this important subject. But so far as concerns two-year students (other than students taking degree courses), newly admitted this year, and one-year students or certificated students admitted in any later year, the Board feel that the time has come when they must require that each college shall provide such instruction in the principles and practice of free standing exercises as will enable each such student on leaving college to have obtained a just appreciation of the importance and the bearing of this subject in the elementary school child's school-life, and to be able to give efficient systematic teaching to the children on the lines of the Board's official syllabus of physical exercises for public elementary schools. There is hardly any part of the professional equipment of persons preparing to be teachers in public elementary schools more essential than that which will enable them wisely to supervise the physical development of the children, and effectively to assist them both in improving their physique and in engendering in the children such habits in the matter of posture, exercise, breathing, etc., etc., as will help them to resist the evil effects of bad surroundings, and obviate many of the results of overcrowding, over-pressure, and kindred disadvantages.

The Board consequently regard it as one of the chief duties of the training colleges to ensure that each student, upon the completion of his or her course, should not merely be qualified to handle a class efficiently in the Board's syllabus of physical

exercises, but should also have been imbued with the broad physiological and hygienic principles which underlie it, and have at least attained such an attitude of mind towards this important part of the school's work and influence, and such an instinctive appreciation of cause and effect in this sphere, as will induce in him a habit of keeping in view throughout his school work both the ends to be secured and the dangers to be avoided. It is to be remembered, therefore, that while suitable and adequate exercises, games and drill, intended for the benefit (physical and otherwise) of the students themselves, are important elements in the life of a training college, they cannot be regarded as an adequate substitute for the careful training of the students in courses specially designed to render them (when they become teachers) capable of giving effective attention to the physical health and development of young children.

In this connection it must be remarked that while the need for good courses of training in free standing physical exercises has been recognised, and to a considerable extent met as regards women teachers (although far less in elementary schools, unfortunately, than in secondary), there is an almost complete dearth in England of efficient courses for men teachers or students. In a few areas, among which may be mentioned Surrey and parts of Yorkshire, the local education authorities have provided (sometimes in pursuance of suggestions from Colonel Fox, the Board's adviser in this subject) evening courses or Saturday morning classes in free standing exercises for some of the men already on the teaching staffs of their public elementary schools, but these efforts have hitherto been sporadic and do not, of course, deal with the problem of "intending teachers" during the training college course, nor with the teaching staffs of the training colleges themselves. It is, therefore, to be feared that training colleges for men students may have great difficulties in finding, without loss of time, an adequate number of men who have been sufficiently trained in the methods of the Board's official syllabus to be able to give efficient instruction to the training college students. In the hope of doing something towards gradually providing a supply to meet this need, the Board are recognising a special course for young men that is to be organised in September, 1908, at the South-Western Polytechnic Institute, Chelsea. The course will comprise a year's work in the principles and practice of free standing physical exercises, in hygiene, and in certain allied subjects, on lines analogous to those already so successful in the case of women teachers and students. Suitably qualified young men will be encouraged to take this course, with the aid of the Board's grants for "third-year students," "certificated students," or "one-year students," as set out in chapters III. (especially section 30 (a) (ii)), IV., V. (especially section 39 (c)) and X. (especially section 58) of the following regulations. Should any other publicly managed institutions engage to provide suitable courses of this kind on lines specifically approved for the purpose by the Board, the same arrangements for third-year or one-year students may be approved in connection with

them. It is to be hoped that suitably qualified men will at once come forward to take advantage of this year of special training, so that by 1909, at latest, there will be a number of well-trained men ready to take the posts which the training colleges and local education authorities must by that time be establishing in constantly increasing numbers.

The following is the syllabus referred to in the above memorandum. It is stated that this syllabus is intended to serve as a model for general guidance, but that alternative syllabuses may be submitted to the Board for approval, provided they are not less comprehensive than this:—

LECTURE I.—INTRODUCTORY.

The place of man in the animal kingdom.

The cell as unit of tissues and organs of the body. Its life, growth, and reproduction (compare amoeba).

Structure and function, work and rest. Division of labour.

The child a developing and immature human being. Factors influencing its development: (a) heredity and antenatal conditions; (b) environment; (c) nutrition and training (particularly of brain and nervous system during plastic period of growth).

LECTURE II.—THE SKELETON AND MUSCULAR SYSTEM.

The skeleton and its development in the young. Joints. Locomotion.

Importance of attitudes and postures. Spinal curvature.

The muscular system and its relation to the nervous system.

Influence of proper and sufficient food (rickets). Alcohol.

Physical exercises, drilling and games. Muscular fatigue.

LECTURE III.—THE DIGESTIVE SYSTEM.

The alimentary canal.

Process of digestion, commencing in mouth. Hygiene of mouth, teeth, etc.

Dietaries. Amount and sorts of foods for children, uses and values. Characteristics of unsound food.

Evil results of wrong feeding, underfeeding, food poisoning. Dangers of stimulants, alcohol, tea, etc.

Signs of malnutrition.

LECTURE IV.—THE RESPIRATORY AND CIRCULATORY SYSTEMS.

The purpose of the circulation of the blood. Blood, heart and blood vessels. Anaemia. The lymphatic system.

The lungs. Correct breathing. Obstructions to breathing (adenoids).

Purpose and mechanism of respiration. Breathing exercises.

Difference between fresh and expired air.

Relation of respiration and circulation to nervous system. The effects of exercise, posture, occupation, malnutrition, tight clothing, alcohol, etc. Advantages of an open-air life.

LECTURE V.—THE EXCRETORY SYSTEM.

Waste matter—in tissues as result of work, in bowel as undigested and indigestible food.

Excretory organs and how they work: skin, alimentary canal, kidneys, lungs.

Evils resulting from delayed or irregular excretion.

Importance of personal cleanliness, regular habits, nutrition, clothing.

The care of the body.

LECTURE VI.—THE NERVOUS SYSTEM.

Brain, spinal cord, motor and sensory nerves.

Reflex action. Brain centres and nerve cells. The way the brain works. Co-ordination and association.

Requirements of a healthy nervous system (nourishment, regular habits, physical exercises, manual and intellectual work, periods of rest and change of occupation). Evil effects of malnutrition, defective senses, overstrain, impure air, bad habits, alcohol, etc. Causes of mental dulness, headaches, neuralgia.

Development of child's mind and nervous system (sensory receptivity, reflex movement, imitation, attention, self-control; nourishment and education of nerve cells).

Physical and mental fatigue.

LECTURE VII.—SENSE ORGANS.

Relation of senses to nervous system.

Their training and development.

Sense of Sight.—Structure of the eye. Eye muscles; mechanism of accommodation.

The visual centre in the brain.

Defects of vision and common eye diseases.

Eye strain, particularly in young children.

Short and long sight, etc. Vision testing.

Effect on sight of bad light, long hours, small print, close work, etc., especially in childhood.

LECTURE VIII.—SENSE ORGANS (continued).

Hearing.—Structure of ear. The auditory centre in the brain. Causes and signs of defective hearing. Tests. Deaf-mutism.

Speech.—The structure and use of vocal organs. Voice training and defective articulation. Speech centres. Aphasia.

Sense of Smell.

Sense of Touch.—Co-ordination, temperature, feeling, muscular sense.

LECTURE IX.—SANITATION OF THE SCHOOL.

Requirements of the healthy school:

Suitability of site, soil, and construction (various types of school buildings).

Water supply.—Collection, storage, and distribution. Various forms of pollution. Methods of prevention.

Sanitary conveniences (various types), drainage, refuse removal. Earth closets and their management.

Effects of sewer gas.

LECTURE X.—SANITATION OF THE SCHOOL (contd.).

Ventilation—cubic capacity, amount of fresh air necessary. Impurities of atmosphere and their effects. Methods of ventilation.

Warming and lighting.

Equipment.—(Class-rooms, desks, blackboards, cloak-rooms, lavatories, etc.). The hygiene of infant departments.

Cleanliness.—Class-room as an object lesson in health.

Duties of individual in relation to health of community.

LECTURE XI.—DISABILITIES AND DISEASES OF CHILDREN.

Characteristics of normal and abnormal children (mental and physical defects).

The relation of micro-organisms to disease. Conditions of their life. Relation of seed (bacteria) and soil (body tissues). Means of resistance.

Inherited tendencies and conditions due to environment (dirt, neglect, exposure, etc.). Predisposition to disease.

Early signs and symptoms of ill-health in children (nervous diseases, infectious diseases, tuberculosis, parasitical diseases).

LECTURE XII.—MEDICAL INSPECTION OF SCHOOLS, ETC.

The objects and method of medical inspection of schools and school children.

Methods of detecting and dealing with physically and mentally defective children.

Direct and indirect means of cultivating good physical habits in school, and adapting education to the physical needs of the child. (Example and health of teacher, games, physical exercises, ventilation, cleanliness, absence of near-eye work).

School closure and exclusion of children on medical grounds. First aid in minor injuries and common ailments.

Disinfection.

MEDICAL OFFICERS AND THE WORKMEN'S COMPENSATION ACT.—At the Enniscorthy Quarter Sessions, Judge Barry, K.C., decided that a medical officer of the Killanim dispensary district was a workman within the meaning of the Workmen's Compensation Act. The claim was made by Mrs. Murphy, the widow of the medical officer against the guardians of the Union. Her husband had been summoned to see a woman who had been accidentally shot, and while he was on his way he was thrown from his trap and fatally injured. The sum of £300 was awarded as compensation. The guardians have given notice of appeal.

DUNDEE TOWN COUNCIL AND THE MEDICAL OFFICER'S TRIP TO WASHINGTON.

THE Dundee Town Council on July 2nd, says the *Dundee Advertiser*, debated at length—and with very considerable heat that came from the introduction of the personal element—the proposal to send Dr. Templeman to a congress on tuberculosis, to be held at Washington, U.S.A. Though on hygiene bent, the council had a frugal mind. It was resolved that the doctor should go forth on this mission, but that his expenses should be limited to £50, he, during his absence, to pay for a substitute. Mr. Buttar, arguing for a liberal view of the question, and Mr. Burke, who denied the utility of representation, fell foul of each other in a heated controversy. Mr. Buttar, resenting a ruling from the chair, made a dramatic exit, declining to vote, and declaring that he was done with the council for ever. Mr. Ballingall, at a subsequent stage, also showed his disapprobation of the conduct of debate by leaving the meeting.

MEDICAL OFFICER'S TRIP.

From September 21st to October 12th the Sixth International Congress on Tuberculosis is to be held in Washington, U.S.A., and the Public Health Committee recommended that Dr. Templeman, medical officer, should be sent as the Town Council representative, and that he be paid £50 towards his expenses.

Mr. Buttar, in moving disapproval of the minute, held that, if the congress was worth sending to, then it was worth paying the expenses of the representative. The idea of sending an official on the understanding that he would pay part of the expenses himself was unheard of, undignified, and ridiculous. To an industrial community like Dundee the question of tuberculosis was one of leading import, and Mr. Buttar was strongly of opinion that the council should send a delegate to Washington. He added that the cost of the recent Continental deputation was £40 per head.

Mr. Don pointed out that, of the proposed £50 grant, £20 was to be paid by Dr. Templeman to a *locum tenens*.

Mr. Stevenson seconded Mr. Buttar's disapproval of the minute.

Mr. Burke moved that Dr. Templeman be not sent to the congress, and said that there should be no expense in connection with tomfoolery of the kind. Mr. Buttar's position would be easily understood when it was stated that there had been a good deal of canvassing since the committee came to its finding.

The Lord Dean of Guild asked if Mr. Burke was certain of that.

Mr. Burke declared that he was absolutely certain—he was always certain of what he said. Mr. Burke was proceeding to refer to the necessity of the medical officer staying at home to attend to his duties, and spoke of the extension at King's Cross Hospital as an instance of the increase of his duties, when

The Lord Provost said the extension of King's Cross Hospital was not germane to the question as to whether the doctor should be sent to the congress.

Mr. Burke proceeded to refer to the doctor and his duties, and challenged those members of the council who were advocates for this holiday for the medical officer of health at the public expense to tell the public one advantage that was to be derived that would be worth a twopenny curse. He asserted that it was a specially arranged trip, and had been canvassed for.

Mr. McCrae seconded, although he dissociated himself from the views expressed regarding the doctor by Mr. Burke. He had not been canvassed, nor had he heard anything about canvassing until now, but, all the same, he considered that to send Dr. Templeman to a congress in the United States was nothing short of tomfoolery and of a scandal.

Mr. Carnegie moved the approval of the minute. He was proceeding with his argument when Mr. Burke interjected "Question."

Mr. Carnegie objected to such interruptions.

Mr. Burke: I am entitled to question any statement in a parliamentary manner.

Mr. Carnegie went on to say that Dr. Templeman was the doctor of the poor, and it was in the interest of the poor chiefly affected by tuberculosis that the congress was being held.

Bailie Martin seconded, holding that Dr. Templeman was an acknowledged authority on the subject, and if anyone in this country could do good service at the congress, he was the man.

Mr. Robertson spoke of the value of the results to medical science likely to accrue, and favoured the sending of the doctor.

Treasurer Urquhart believed Dr. Templeman eminently qualified to attend the congress, but he could not approve of him leaving Dundee for so long a period as six or eight weeks when the city was threatened with an outbreak of typhus fever.

Mr. Burke proceeded with interpolations, and the

Lord Provost asked him to be silent while members were speaking.

Mr. Buttart: I beg to move the suspension of Mr. Burke unless he can behave himself. This thing cannot be tolerated.

Mr. Burke: The only person who can be tolerated is Mr. Buttart.

Treasurer Urquhart: Some allowance must be made for the abnormal heat. (Laughter.) He proceeded to suggest a remit back for the purpose of considering the advisability of sending Dr. Foggie, who was in charge of the consumption dispensary, as representative of the council to America.

Mr. Speed wished to inform the council that the cost of the Continental deputation was not £40 per head. The accounts amounted to £83 10s.

A query by Mr. Buttart elicited the fact, however, that this was the total for three members only. There were four on the deputation.

Mr. Speed, in seconding Treasurer Urquhart, remarked that, after all, Dundee was a small town compared with the great cities of the kingdom, and they should know what they were doing.

Mr. Don remarked that at the committee meeting it was distinctly stated that the doctor was to pay for his substitute while he was away, the amount being given as £20.

Treasurer Urquhart: If that is correct, it is a very mean arrangement.

The Clerk replied that the doctor stated he always paid a substitute in his absence, and proposed to do the same on this occasion.

Mr. Buttart, replying on the debate, declared that Mr. Burke knew nothing about the public opinion of Dundee; at least, the public opinion he (Mr. Buttart) had any respect for.

Mr. Burke: The hoity-toity gents. (Laughter.)

Mr. Buttart (proceeding) declared that the public opinion of Dundee was that Dr. Templeman was one of the first medical officers in Great Britain. Mr. Buttart went on to make a further statement flattering to the medical officer, when Mr. Burke called him in question on a point of order.

The Lord Provost: Mr. Buttart is entitled to express an opinion, and he must take the responsibility.

Mr. Burke: He is not stating it as an opinion, but as a matter of fact.

The Lord Provost (to Mr. Burke): You must resume your seat.

Mr. Buttart: Or go outside. (Laughter.)

Mr. Burke: I call upon Mr. Buttart to withdraw that.

Mr. Buttart at once agreed on being requested to do so by the Lord Provost.

The Lord Provost: Why is it you cannot carry on business of this kind in a proper and quiet way?

Mr. Buttart: Because you cannot keep him in order. I know Mr. Burke perhaps better than any man in this room, and I know that his move just now is entirely personal animus against Dr. Templeman.

Mr. Burke: I rise to a point of order. This is a deliberate and malicious misrepresentation of fact. What Mr. Buttart knows about me—

Mr. Buttart: You ought to be ashamed of.

Mr. Burke: Is a matter of indifference to me. What I know about Mr. Buttart is unfit for comment.

Mr. Buttart was about to resume when the Lord Provost rang his bell and informed him his five minutes were up. He had, he added, wasted his time in irrelevancies.

Mr. Buttart: I do not wish to be disrespectful to you, but you have permitted interruptions.

The Lord Provost: I have not. I have done all I could to prevent interruptions.

Mr. Buttart: This is the last time I will appear at this council unless I am allowed to reply.

Mr. Burke: Mr. Buttart is playing the part of bullying the chair.

Mr. Buttart: I think this council, since Mr. Burke came in, has to a large extent been dominated and bullied by him.

The Lord Provost: That is not a reply on the debate, and I call on the town clerk to call the roll.

The council then divided as between the proposal to remit back and the approval of the minute. The vote was:—Remit, 5; approve, 16.

REVIEWS.

DIETS IN TUBERCULOSIS. By Noel D. Bardswell, M.D., M.R.C.P., and John E. Chapman, M.R.C.S., L.R.C.P. (Oxford Medical Publications). London: Henry Frowde. Pp. 184. Price 5s. net.

Public Health reformers may be ranged in two main groups, according to whether in their proposed reforms they do or do not cut their coats with some reference to the amount of cloth at their disposal. In the second class are to be found those milk reformers who are unable to see that the fact that their reforms would necessitate a hundred per cent. rise in the price of milk constitutes any practical objection to those reforms. Drs. Bardswell and Chapman belong to the former class of reformers. They are practical men, and they approach the important subject of diets in tuberculosis from the point of view indicated by the following quotation from the present volume:—

"It is no use telling a consumptive working man earning 25s. a week, and with a wife and family to keep, to take three pints of fresh milk and plenty of meat and butter daily. We have often heard this counsel of perfection given in hospital out-patients' departments to a consumptive who had less than 8d. a day for the purchase of his food. Some precise information as to how he might provide himself with an adequate diet for this 8d. would be far more useful."

To obtain this information the authors entered upon a seven years' investigation, for which a grant was made by the Royal Society, and the results are presented in this book, which represents their final report. In their inquiry the authors sought to determine the following points:—

1. The best principles upon which dietaries for consumptives should be constructed.
2. The nutritive value in terms of proteid, and total calorie value, of the diet which is suitable for the treatment of the average consumptive; in short, a standard diet.
3. The best lines upon which such an efficient dietary can be economically constructed for actual use.
4. The minimum cost at which a suitable dietary can be bought retail."

It is unnecessary to emphasize the importance of securing precise information on these points. In the sanatorium treatment of consumption the cost of food frequently amounts to about 40 per cent. of the total working expenses of the institution. The authors found that in seventeen working-class sanatoria investigated by them, the average daily cost of the patients food was 17½d. per head, and by their inquiries they have now shown that a thoroughly satisfactory diet can be purchased for 11½d. The importance of this result becomes more evident when it is borne in mind that a daily saving of 5d. per head in the case of a sanatorium of fifty beds would mean an economy of £1 per day, or some £350 a year. Drs. Bardswell and Chapman have done an exceedingly useful piece of work, and we can warmly recommend this book, together with Dr. Bardswell's former volume on "The Consumptive Working Man," to all who are interested in the prevention of tuberculosis.

Mr. Buttart declined to vote, and, leaving his chair, exclaimed that he was done with the town council "for ever."

A division took place as between "approve" and "disapprove" as follows:—Approve, 16; disapprove, 4.

A final division took place as between the approval of the minute, which provides for a payment of £50 towards the doctor's expenses, as against Mr. Buttart's proposal to pay expenses on a higher scale. The vote was:—Approve, 13; for Mr. Buttart's motion, 8. Dr. Templeman accordingly will go to America, and will receive for expenses the sum of £50.

PRIZES FOR HEALTHY BABIES AT HALIFAX.—

On July 2nd there was a novel and interesting gathering at Bank Field Municipal Mansion, Halifax, when the Mayor (Alderman W. Wallace) presented certificates to those parents who are entitled to them under his baby bounty scheme. About seven months ago the mayor offered to pay £1 to the parent or guardian of each of the first 100 babies born in the borough in 1908, who attain the age of twelve months. Of the 100 registered, eight have died, and ninety-two are qualifying for the bounty. Eighty-one of these babies were taken by their mothers to the gathering on July 2nd, and they formed an interesting group while they were being photographed on the terrace. The Halifax medical officer of health (Dr. Neech) and Dr. Burman, president of the Yorkshire Branch of the Incorporated Society of Medical Officers of Health, delivered brief but encouraging addresses. After tea had been served in the mansion, the medical officers of health had to decide which were the best nourished and developed babies, and entitled to the prizes offered by the mayor. Each baby was examined and weighed, and this necessarily took up a great deal of time. Dr. Neech described his work as a pleasurable duty, but a difficult task. Most of the babies were not quite six months old, and it was ascertained that fifty-nine were fed by mother's milk. The first prize was awarded to a breast-fed female baby, who weighed 21lb., the second and third prizes being secured by two male babies weighing 20lb. and 19½lb. respectively. Of the bottle-fed babies the first prize was awarded to a male baby, who weighed 19½lb. The interesting fact was elicited that this was the mother's twelfth child.

BORACIC ACID IN MILK.—At Westminster Police Court, on July 10th, a number of firms were fined nominal penalties for selling as cream, an article containing cream mixed with boracic acid as a preservative. These have been adjourned pending the appeal to the High Court in *Cullen v. Mc. Nair*, reported *ante*, p. 213. The magistrate intimated that in future cases the fine would probably be £5 or more.

PUBLIC HEALTH LABORATORY WORK. Fourth edition. By H. R. Kenwood, M.B., D.P.H. London: H. K. Lewis. Pp. 14 and 468. Price 10s. net.

This is the fourth edition of Professor Kenwood's well-known laboratory text book, which has been revised and in some part re-written. The first six parts of the book, which deal with the chemical, microscopical, and physical examination of water, sewage and sewage effluents, soil, air, food and disinfectants are by Professor Kenwood, while Part VI, which consists of ten chapters on public health bacteriological work, is contributed by Dr. Savage. There is also an appendix on the standardisation of media, the demonstration of bacteria in sections of the tissues, and autopsies on animals for bacteriological purposes.

The book is the outcome of much teaching experience. The authors have a keen perception of the difficulties the student encounters when beginning his analytical work, and they have been remarkably successful in removing them. The information given is the right kind of information, and it is presented with transparent clearness. The student is not over-burdened with detail, but he is given precisely the details he needs, and his feet are guided up the successive steps of the various processes in a way that reduces the possibility of a mistake to a minimum. As a laboratory bench-book this work, so far as our experience goes, is unique in its excellence, and it is indispensable to the public health student, and also to all medical officers of health who wish to keep themselves well-informed on modern analytical methods.

CAST-IRON HOUSE DRAINAGE. By Gerard J. G. Jensen, C.E. London: The Sanitary Publishing Company, 1908. Pp. 206.

Whatever Mr. Jensen writes on the subject of house-drainage is well worth reading, and this volume makes a specially opportune appearance at the present time, when the development of heavy motor traffic has intensified the need for cast-iron drains. Most sanitarians will, we imagine, be in sympathy with the view expressed in the following extract from one of Dr. Wynter Blyth's reports, which forms, as it were, the text of Mr. Jensen's book:—

"The vibration from heavy motor traffic and from underground railways is affecting . . . the whole of the metropolis, more or less seriously, along the main lines of traffic. There have recently been instances of absolutely new drainage becoming defective from fracture of pipes, and, in the writer's opinion, in certain situations in which vibration is to be expected, the only safe way will be the construction of iron instead of earthenware drainage. Drainage is a costly matter, and when once put down, should not require renewal for at least a quarter of a century."

Mr. Jensen is a strong advocate of iron drains, and in this book he has given a clear, readable and thoroughly practical account of the essentials of a good iron drainage system. Materials, joints, and construction generally are described in detail and with copious illustrations, and there is an adequate discussion of the planning and arrangement of

drains and sanitary fittings. In the arrangement of ventilating pipes Mr. Jensen may be considered a little heterodox, for in those cases where the soil-pipe is situated in the middle of a drainage system, he prefers an inlet at each end of the drain rather than an inlet at one end and a subsidiary outlet pipe at the other, as is required in the bye-laws in force in London and Manchester. But he gives reasons for his opinions, and his treatment of the subject of cast-iron drainage is so excellent that we can confidently recommend the book to all who are concerned in the planning and supervision of drainage work.

THE PUBLIC HEALTH ACT, 1875, and other Statutes and part of Statutes relating to Public Health, preceded by a complete index by Herbert Davey. London: Knight and Co., 1908. Price 8s. 6d.

The last edition of Knight's "Public Health Statutes" contains the five Acts relating to public health that were passed in 1907, and the index has been brought up to date. The whole matter has been revised, and all repealed enactments have been either wholly omitted, or, where their terms might be useful for reference, they have been retained and indicated by the use of underlined type. This book is so well-known that it hardly requires comment. Its numerous editions form the best proof of its continued usefulness.

OBITUARY.

WILLIAM JOHN BROCK, M.B., C.M., D.Sc. (Pub. Health), Edin., F.F.P.S., Glas.

We regret to record the death of Dr. William John Brock, Medical Officer of Health for the Counties of Mid-Lothian, West Lothian and Peeblesshire, and for the Burghs of Linlithgow, South Queensferry, Whitburn and Inverleithen, which took place suddenly at Edinburgh on July 6th. Dr. Brock had been in failing health for some two or three years, and about a fortnight before his death, while visiting the Brantsfield district in his motor car, he came into collision with a tramway car, and was much shaken. He took to his bed, but on July 5th he had so far recovered that he was able to get up. On coming downstairs, however, he slipped and fell, cutting his head, and although the wound was not serious, he developed symptoms of heart failure on the following day, and died in the afternoon. Dr. Brock was for sixteen years Medical Officer of Health for Mid-Lothian, and previously he was Medical Officer of Health for Caithnessshire. He was well known in Scotland as an efficient and highly respected officer. Dr. Brock was an occasional contributor to the professional journals, and in 1905 he published his book on "Scottish Sanitary Laws and Principles of Public Health." The funeral, which took place in the Dean Cemetery, Edinburgh, on July 9th, was attended by a large number of medical men from the city and the surrounding districts.

PROCEEDINGS OF THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

PROVINCIAL MEETING.

THE Society held its Annual Provincial Meeting on Saturday, June 27th., 1908, in the Burgh Hall, City Chambers, Glasgow. There were present Drs. J. C. McVail, E. Sergeant, C. Templeman, A. Robb, A. K. Chalmers, F. Dittmar, J. Knight, M. Gepp, Alex. M. Williams, J. Dawson, C. K. MacDonald, A. C. Miller, J. T. Wilson, J. A. Hislop, J. T. Prangnell, Jno. Orton, R. A. Jack, E. Watt, W. S. Cook, James Stevenson, and Herbert Jones (members), and the following visitors: Mrs. J. C. McVail, Mrs. Jno. Orton, Mrs. Stevenson, Dr. Maud McVail, Bailie James Steele, Bailie Dick, Bailie E. Guest, Professor Ebenezer Duncan, Drs. D. C. McVail, Hugh MacEwen, R. M. Buclanan, M. MacDonald and W. F. MacDonald, Messrs. Oliver Ransford, T. Young, and M. H. Prangnell.

The chair was taken by Dr. J. C. McVail, the senior Vice-president present.

The HON. SECRETARY read a letter from the President (Dr. George Reid), in which he stated that an important official engagement alone prevented his being present at the meeting.

Bailie JAMES STEELE, chairman of the Health Committee, in welcoming the Society on behalf of the Glasgow Corporation, said that this was the first visit they had paid officially to Glasgow. They were charged not so much with the cure of disease as with its prevention. A government inspector visiting Glasgow early last century described it as one of the worst places he had ever been in—socially, morally, and physically; now they prided themselves that in all these respects they stood very high. He concluded by reading a letter from the Lord Provost, apologising for absence owing to a long-standing engagement in London. Sir William Bilsland wrote that he should have liked very much to have expressed how highly he valued the health department as an important feature of municipal work. He was early attracted to it through his friendship with the late Dr. J. B. Russell. He was in his confidence in regard to a great many of Dr. Russell's schemes for improving the sanitary condition of the city, and he was able to see in subsequent years the wonderful foresight of his planning. The ideals which Dr. Russell cherished had been well followed by his successor, Dr. Chalmers.

After thanking Bailie Steele for the welcome which had been accorded the Society by the citizens of Glasgow, Dr. McVail said: "We greatly regret the absence of the president, Dr. George Reid, of Staffordshire, who should have occupied the chair to-day. Members of the Society are aware that Dr. Reid has recently passed through a long and serious attack of enteric fever, but we rejoice to know that he is now convalescent, and has been able to resume work; and I beg to move that we formally congratulate him on his recovery, and express our hope that he may never again have any similar experience of illness."

"Another very pleasant duty falls to be performed at this meeting. I am sure it was with the utmost

satisfaction that we observed in yesterday's newspapers, in the list of the birthday honours conferred by his Majesty, the name of Mr. W. H. Power, C.B., F.R.S., who has now been made a K.C.B. Until his retirement a few months ago, Mr. Power, as medical officer of the English Local Government Board, was the official head of the public health service of England. He has been a most worthy and distinguished successor to Simon, Buchanan, Seaton and Thorne. Avoidance of publicity has characterized all his work, but the great services which he has rendered to the country have manifested themselves in spite of his persistent self-effacement. Long before the micro-organic cause of diphtheria was discovered and light thereby thrown on the methods of spread of the disease, Power had reported on its conveyance by means of school attendance. His pioneer work in investigating the relationship of infectious diseases of man to those of the lower animals is recorded in the Local Government Board's reports. His classical researches into the influence of small-pox hospitals in spreading virulose infection in the metropolis during the pandemic of the early seventies, and subsequently, have formed the basis of all later investigations of the problem, and have resulted in the removal of such hospitals from thickly populated centres, and their establishment in much safer surroundings.

"By a remarkable exercise of a rare faculty of scientific imagination, Power evolved a hypothesis of the causation of lead poisoning by peaty waters, which, on being put to the test by subsequent bacteriological and chemical inquiry, was found to meet all the facts of the case, with the result that the prevention of plumbosolvency of existing water supplies is now regularly practised by methods which are alike simple and satisfactory, and that the ability of untried waters to dissolve lead is easily ascertainable before new schemes of supply are entered on. Though Sir William Power has retired from the medical officership of the Board, he still remains chairman of the Royal Commission on Tuberculosis and a member of the Royal Commission on Rivers Pollution, and we still look forward to a long period of valuable public service by him in this and other directions. I beg to move the following resolution:—

"That the Fellows and Members of the Incorporated Society of Medical Officers of Health congratulate Sir William Henry Power upon the distinction recently conferred upon him by His Majesty the King, and desire to place on record their appreciation of the invaluable services he has rendered to the public health service during the whole of his official career."

The resolution was seconded by Dr. EDWARD SERGEANT and carried with acclamation.

An unusually large number of candidates were nominated for election.

Dr. A. K. CHALMERS read a paper upon "The Growth of Cities in relation to Town Planning."

In the discussion which followed, the following took part:—

Dr. E. Sergeant, Dr. John Orton, Bailie Guest, Dr. M. Gepp, Dr. Knight, Dr. Dittmar, Professor Eben. Duncan, Drs. J. T. Wilson, A. Robb and Herbert Jones.

It was proposed by the CHAIRMAN, seconded by Dr. TEMPLEMAN and unanimously resolved that the best thanks of the Society be given to the Lord Provost and the Corporation of Glasgow for the hospitality which had been so generously extended to the Society.

It was proposed by Dr. E. SERGEANT, seconded by Dr. JOHN ORTON and unanimously resolved that the hearty thanks of the Society be given to the Scottish Branch for the arrangements which had been made for the entertainment of those present at the meeting.

At the conclusion of the meeting the Society

lunched with the City Corporation in the City Chambers.

In the afternoon, on the invitation of the Scottish Branch, an excursion was made to Loch Lomond. Train was taken from Glasgow to Balloch, and thence the journey was continued by steamer to Tarbet, where tea was served. The weather was delightful, and upon every hand were expressions of appreciation of the thoughtfulness of the Scottish Branch in arranging so enjoyable an outing. It only remains to congratulate Dr. Alex. Robb, the secretary of the Scottish Branch, upon whom fell the task of carrying out the meeting, on the successful issue of his labours.

Extraordinary General Meeting.—An Extraordinary General Meeting of the Incorporated Society of Medical Officers of Health, was held in the Law Courts, at Cardiff, on Friday, July 17th. The following members were present:—Drs. D. S. Davies, J. D. McCrindle, E. W. Rees Jones, W. H. Symons, T. Eustace Hill, T. Horne, G. R. Parker, M. J. Rees, P. W. G. Nunn, E. Sergeant, W. M. Hamilton, A. Greenwood, E. M. Smith, S. G. Moore, R. Prichard, H. M. Richards, H. O. Pilkington, J. Tubb Thomas, F. J. H. Coutts, W. F. Dearden, Herbert Jones, W. Lloyd Edwards.

Dr. D. S. Davies was voted to the chair. The Hon. Sec. read the notice convening the meeting. The minutes of the previous Extraordinary General Meeting, held at the offices of the Society, in London, on June 19th, were received, and the Resolutions passed, altering the Articles of Association (see pp. 206, 207 and 208), on that occasion were unanimously confirmed as Special Resolutions.

Midland Branch.—The members of the Midland Branch of the Incorporated Society of Medical Officers of Health met on Thursday afternoon at the Foleshill Infectious Hospital, Coventry, by special invitation of the President, Dr. J. Orton. After inspecting the new hospital, which is regarded as a model one, the members held their business meeting and elected the following officers for the coming session:—President, Dr. Green (King's Norton); President-Elect, Dr. F. H. May; Vice-Presidents, Drs. Hill, Manley, H. May, and Orton; Council, Drs. Ridley Bailey, Barwise, Reid, Boobbyer, Malet, Snell, and Robertson; Hon. Treasurer, Dr. Bostock Hill; Hon. Secretary, Dr. Snell; Representatives, Drs. Bostock Hill and Manley.

The most important item of business was the consideration of the extraordinary step taken on Wednesday by the Bilston Urban District Council in dismissing Dr. Ridley Bailey, Medical Officer of Health for Bilston, from his position as Medical Superintendent of the Fever Hospital. Dr. Ridley Bailey is an ex-President of the Staffordshire Branch, and of the South Staffordshire Division of the British Medical Association, and also an ex-President of the Midland Branch of the Incorporated Society of Medical Officers of Health. The fact that he has done excellent service as Medical Officer of Health and as Superintendent of the Fever Hospital at Bilston, and that there have been no complaints as to the manner in

which he has discharged his duties appears to have been admitted by those members of the council who supported this ill-advised motion, and the only reason brought forward in support of it was that the two appointments should not be held by one officer. The separation of these two offices is directly opposed to the best interests of public health and public convenience. The dismissal of a public officer under such circumstances and without clear reasons must have the effect of a vote of censure for which there is no possible justification, and from reports that are prevalent in the locality there appears to be urgent reasons in favour of an immediate public inquiry into the exact circumstances that have led up to the extraordinary step that was taken at the meeting on Wednesday.

The following resolution was passed unanimously:—

"That this branch desires to express its indignation and astonishment at the extraordinary step taken by the Urban District Council of Bilston with regard to the appointment of their Medical Officer of Health as Superintendent of the Fever Hospital. The members of this branch feel that such a step casts a slur, not upon the medical officer of health, but upon the Urban District of Bilston, and they feel confident that under the extraordinary circumstances of the case no medical man of any standing whatever in his profession would be found to accept the position thus made vacant."

Yorkshire Branch.—The annual dinner of the Yorkshire Branch of the Incorporated Society of Medical Officers of Health was held on Friday evening, June 19th, 1908, at the Hotel Metropole, Leeds.

List of members present:—Drs. Bampton (Ilkley), Baskett (Halton), Buck (Rothwell), Burman (Wath-on-Dearne), Cameron (Leeds), Veitch Clark (Leeds), Forsyth (Birstall), Foster (Shipley), Halliwell (Dewsbury), Hunter (late of Pudsey), Johnstone (Harrogate), Milne (Mirfield), Neech (Halifax), F. Robinson (Wakefield), Scatterty (Keighley), Sisam (Wakefield), Smith (York), Stedman (Selby), Thorp (Holmfirth), Webster (Golcar), Wiltshire (Hemsworth), Kaye, hon. sec. (Wakefield).

Dr. F. J. Burman, the medical officer of health for the urban districts of Wath and Bolton-on-Dearne, and the chairman of the branch for this year, presided at the table, round which were gathered some thirty medical officers from all parts of the county. The principal guest of the evening was Dr. Arthur Newsholme the newly appointed Chief Medical Adviser to the Local Government Board, and formerly medical officer of health for Brighton. Other guests included Dr. Wainman, chairman of the Sanitary Committee of the Leeds Corporation, Councillor E. E. Lawson, Professor Grunbaum, Major de Burgh Birch, and other medical luminaries.

After the toast of "The King" had been enthusiastically honoured, "The Army, Navy, and Territorial Force" was proposed by Dr. BAMPTON,

who remarked that the welfare of the forces was often intimately associated with public health problems.

Colonel DE BURGH BIRCH, in responding, stated that during the South African campaign a great many health lessons had been learned. Regarding the newly established Territorial Force, the greatest care had been taken in devising the scheme, and its public health aspects have been kept in the forefront. He pointed out that when large bodies of troops are on the move, one of the first duties is to provide good water, and this important task is often one of extreme difficulty and calls for the best knowledge and experience. He would therefore like medical officers of health to join the Territorials with the idea of assisting in time of need to put the greatest number of rifles in the field, for this can only be done by due regard being given to hygienic precautions, which, if neglected, may result in half of the men being sent home ill. Here again he announced that the best possible scheme has been devised, and the medical authorities have been considering the question of supplying the troops with sterilised water.

The toast of "The Public Health Service" was proposed by Dr. WAINMAN, Chairman of the Leeds Sanitary Committee. After referring to the logical end of preventive medicine in reducing the work of the ordinary medical practitioner, he expressed the view that the latter would find employment in the ever-widening field of the public health service. He looked forward to town planning as a means of lessening the evils following the aggregation of large populations, and he passed in review the various matters which are concerned with the welfare of English life. With practical men such as Dr. Newsholme at the head of affairs, the public might be satisfied that the progress made in the past would be continued and much good work accomplished.

Dr. NEWSHOLME, who claimed to be a Yorkshireman, and expressed his great delight at meeting such a body of medical officers of health in his native county, referred to the characteristics of the Yorkshireman in relation to public health matters and generally. He drew attention to the great scope of the service in its widest definition, embracing in some measure such bodies as the Poor Law guardians, the police, the education authorities and social and moral workers in many fields. All these and many other voluntary agencies were engaged in attacking at one point or other and breaking down the vicious circle which subsists between ill-health and poverty and other social evils.

Dr. J. SPOTTISWOODE CAMERON proposed the toast, "Our Guests," which was responded to by Professor GRUNBAUM and Councillor E. E. Lawson.

Dr. W. L. HUNTER (an ex-president of the branch and formerly medical officer of health for Pudsey) proposed the health of the President, and was himself the subject of hearty congratulations on his re-appearance after a period of disablement by illness.

During the evening songs were contributed by Dr. E. M. Smith of York and Drs. Robinson and Kaye (Hon. Sec.) of Wakefield.

CORRESPONDENCE.

THE WAR ON RATS.

To the Editor of PUBLIC HEALTH.

SIR,—In order to obtain accurate information regarding the nature and extent of the damage done by rats within the United Kingdom, my committee have prepared a schedule of questions which they desire to place into the hands of all those who are in a position, from their own experience, to give valuable information concerning temporary or permanent rat plagues in their districts; the damage inflicted by rats, the steps taken by them—individually or in co-operation with others—for preventing such damage, the means chosen for that purpose, and the results obtained.

As the only means of gathering important knowledge of that kind is by favour of the Press—short of undertaking the appalling task of sending the questions to every one likely to suffer, or to have suffered, loss through rats—that is, to every householder in the country—my committee venture to hope that you will permit an appeal to your readers to support the Society by asking for a copy of the schedule and returning it with such information as they may be able to impart.

I enclose a copy of the schedule for your information.

I am, Sir, your obedient servant,

A. E. MOORE, Secretary,

THE SOCIETY FOR THE DESTRUCTION OF VERMIN.

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. Blackburn C.B., 1907, by Dr. Alfred Greenwood. Newport P.S.A., 1907, by Dr. J. Howard-Jones. Bethnal Green M.B., 1907, by Dr. G. P. Bate. Swansea C.B., 1907, by Dr. Ebenezer Davies. St. Helen's C.B., 1907, by Dr. John J. Buchan. Annual Report of the Metropolitan Asylums Board for 1907. Annual Report of the L.G.B. for Scotland for 1907. Report to the L.G.B. on Preservatives in Meat Foods packed in Cans or Glass, by Dr. A. W. J. MacFadden. Holborn M.B., 1907, by Dr. Wm. A. Bond. City of Liverpool, 1907, by Dr. E. W. Hope. Kensington R.B., May-June, by Dr. Reginald Dudfield. Investigation as to the Contamination in Milk, carried out on behalf of the C.B.'s of Bradford, Hull, Leeds, Rotherham and Sheffield, and the Administrative Counties of the East and West Ridings of Yorkshire. Rhondda U.D.C., 1907. Eighteenth Annual Report of Royal Victoria Hospital for Consumption, Edinburgh. Scarborough, 1907, by Dr. John Knight. Edmonton U.D., 1907, by Dr. S. C. Lawrence. Port Elizabeth, 1907. Guernsey, 1907. Interim Report on the Medical Examination of Children in the Elementary Schools, West Bromwich. Stirling County Council, 1907, by Dr. J. C. McVail. Dumbarton County Council, 1907, by Dr. J. C. McVail. Dr. S. Monckton Copeman's Report to L.G.B. on the Brixworth R.D. Monthly Bulletin of Massachusetts State Board of Health. Finsbury, 1907. Dr. F. St. George Mivart's Report to the L.G.B. on Hollingbourn

R.D. Northamptonshire C.C., 1907, by Dr. C. E. Paget. St. Pancras, 1907, by Dr. J. F. J. Sykes. County of Lanark Annual Report, 1907, on the Bacteriological Laboratory.

Journals.

Hospital. Lancet. British Medical Journal. Sanitary Record. Bristol Medico-Chirurgical Journal. British Food Journal. Pacific Medical Journal. Middlesex Hospital Journal. Australasian Medical Gazette. Caledonian Medical Journal. Royal Sanitary Institute. Proceedings of the Royal Society of Medicine. Glasgow Medical Journal. Canadian Practitioner and Review. Transvaal Medical Journal. Municipal Journal. Journal of the Royal Institute of Public Health. American Journal of the Medical Sciences. Official Circular of the County Councils Association. Journal d'Hygiène. Giornale della Reale Società Italiana d'Igiene. Royal Statistical Society. Metropolitan Asylums Board Meeting. Royal Army Medical Corps. Medical Review of Reviews. New Zealand Medical Journal. Birmingham Medical Review. Canadian Nurse.

Pamphlets.

The Bacteriological and Microscopical Examination of Water, by W. J. Dibdin, F.I.C., F.C.S., F.R. San. I., F.R.M.S., etc.

Diseases of Occupation.

By Dr. Thomas Oliver. Methuen and Co., London. 10s. 6d. nett.

Catalogue of Lewis's Medical and Scientific Circulating Library.

Heredity.

By J. Arthur Thomson. John Murray, London.

Foreign Solutions of Poor-law Problems.

By Edith Sellers. Horace Marshall and Son. 2s. 6d. nett.

APPOINTMENTS.

RORY E. McLAREN, M.B., Ch.B., has been appointed Assistant Medical Officer of Health for Leeds.

DR. FRANK SMEDLEY, has been appointed Assistant Medical Officer of Health for the County of Durham.

G. T. CATTELL, M.R.C.S., L.S.A., has been appointed Medical Officer of Health to the Egham Urban District.

JAMES MAIR, M.B., has been appointed Assistant Medical Officer of Health for the Borough of Northampton.

A. P. G. THOMSON, M.B., C.M. Edin., D.P.H., has been appointed Assistant Medical Officer of Health for Hull.

E. TREVOR SHORLAND, M.R.C.S., L.R.C.P. Lond., has been appointed Medical Officer of Health for Westbury, Wilts.

G. R. CARTER, M.R.C.P.L., L.R.C.S. has been appointed Medical Officer of Health to the Penge Urban District.

A. B. HOUSTON, M.B. Glasg., has been appointed Medical Officer of Health to the Droylsden Urban District.

W. P. WARREN, L.R.C.P., L.R.C.S. Edin., and L.M., has been appointed Medical Officer of Health for Enfield.

F. R. BARWELL, M.R.C.S., L.R.C.P., has been appointed Medical Officer of Health to the Mildenhall Rural District.

T. E. RICHARDS, M.B., Ch.B. Edin., has been appointed Medical Officer of Health to the Ystradgynlais Rural District.

G. G. BUCKLEY, M.B. Vict., Ch.B. Vict., D.P.H., has been appointed Medical Officer of Health to the Borough of Crewe.

R. H. MEIKLE, M.B., Ch.B. Edin., has been appointed Medical Officer of Health to the Darlington Rural District.

G. JUKES, L.R.C.P., L.R.C.S. Edin., has been appointed Medical Officer of Health to the Longridge Urban District.

M. DUGGAN, M.R.C.S. Eng., L.R.C.P. Edin., has been appointed Medical Officer of Health to the Bowden Urban District.

P. J. DE NYSEN, M.R.C.S., L.R.C.P., has been appointed Medical Officer of Health to the Halesworth Urban District.

C. R. WILLS, M.B., Ch.B. Edin., has been appointed Medical Officer of Health to the Mansfield Town Council.

W. H. DAVISON, M.B., Ch.B. Edin., D.P.H., has been appointed Assistant Medical Officer of Health to the County of Warwick.

J. E. ANDERTON, L.R.C.P. Ed., M.R.C.S. Eng., has been appointed Medical Officer of Health to the New Mills Urban District.

EDGAR TAUNTON, M.B. Lond., F.R.C.S. Eng., M.R.C.S., L.R.C.P. Lond., has been appointed Deputy Medical Officer of Health for the Borough of Bethnal Green.

GEORGE JUBB, M.D. Glas., has been appointed Medical Officer to the Cheshire County Council Education Committee.

A. HAMILTON WOOD, M.D., D.P.H., has been appointed Assistant Medical Officer of Health, and Inspector of School Children for the County of Warwick.

ANTONY A. MARTIN, M.D. Lond., B.S., M.R.C.S. Eng., L.R.C.P. Lond., D.P.H., R.I.B.C., has been appointed Medical Officer to the Education Committee, Eastbourne.

J. M. CLEMENTS, M.D., R.U.I., M.B., B.Ch., B.A.O., D.P.H., R.C.P.S. Lond., has been appointed Medical Officer of Health and Medical Inspector of School Children to the Batley Corporation.

WILLIAM SINAM, M.D., M.B., Ch.B., B.Sc., D.P.H., L.S.A., has been appointed Medical Officer of Health to the Handsworth District, and School Medical Officer to the Education Committee.

C. A. REYNOLDS, B.A. Oxon., M.B., B.Ch., D.P.H., has been appointed by the Shrewsbury Town Council Medical Officer of Health for the Borough, and Medical Officer to the Education Committee.

R. LAWRENCE, M.D. Vict., M.B., Ch.B., D.P.H., has been appointed Assistant to the County Medical Officer of Health, Cheshire, to devote his whole time to the Inspection of Children in attendance at Elementary Schools in the County Elementary Education area.

LAW REPORTS.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

June 5th, 1908.

BEFORE LORD ALVERSTONE, L.C.J., DARLING AND SUTTON, JJ.

REES v. DAVIS.

Sale of Food and Drugs Act.—Milk—Warranty—Passing on Warranty given by Farm.

A person agreed to sell to a purchaser all the milk received from a certain farmer in the same condition as received and as warranted by the farmer, and the farmer warranted it as pure new unskimmed milk. On proceeding against the purchaser under the Sale of Food and Drugs Act for selling milk not of the nature and substance and quality demanded, it was held that he could avail himself of this warranty as a defence.

This was a case stated by a metropolitan police magistrate on the hearing of an information against Rees for selling milk not of the nature, substance and quality demanded under the Sale of Food and Drugs Acts. It was found that there was an excess of water in the milk. Rees relied on a warranty as a defence. He had bought the milk from one Edwards under the following contract:—"I hereby agree to let you have the milk supplied to me by Mr. Bainbrigge, ex Hazelwood, about eight to twelve barn gallons per day, from now until March 25th, 1908, delivered to St. Pancras, and in the same condition as received, and as warranted by him, viz., pure new unskimmed milk." The milk arrived in a churn with a label attached on which was written "Warranted pure new and unskimmed milk." This was dated and signed by G. H. Bainbrigge. The magistrate convicted, as he did not think the warranty sufficient.

Avery, K.C., and Sankey appeared for the appellant, and Eustace Hills for the respondent. The Court allowed the appeal.

ALVERSTONE, L.C.J., in his judgment, said that Rees had bought the benefit of Edward's contract from Bainbrigge, and the wording of the contract passed on the benefit of Bainbrigge's warranty. There was a warranty by Edwards, and upon the churn was repeated a warranty by Bainbrigge, so all that was needed was some writing to connect the milk with the contract between Bainbrigge and Edwards. The milk came from Bainbrigge to Edwards, and Rees received it as agent for Edwards, and there was ample connection in writing.

Darling and Sutton, JJ., concurred.

CHANCERY DIVISION.

June 23rd., 1908.

BEFORE EVE, J.

OWEN v. FAVERSHAM CORPORATION.

Sewage Pollution—Oyster Beds—Injunction.

The court will grant 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 action brought by the foreman of a company of free fishermen known as the Faversham Oyster Fishery Company. This company had existed from time out of mind, and they had an exclusive right of taking oysters in the manor of Faversham and in the arms of the sea adjacent thereto. The oyster fishery had also existed from time out of mind. The action was for a declaration that the plaintiff company was entitled to enjoy the oyster beds free from pollution for damages, and for an injunction to restrain the defendant corporation from discharging sewage into Faversham Creek, from whence it flowed on to certain oyster beds of the plaintiffs in the East Swale. The pollution by the defendants was admitted. The borough sewage is discharged into the creek in a crude state and without treatment. The Fishmongers' Company had stopped the sale of the oysters from these beds and the oysters had been removed at great loss and expense.

The defendants claimed a prescriptive right, as they had discharged the sewage into the creek for over twenty years. They also contended that the case was one for damages only and not for an injunction.

Macmorran, K.C., P. O. Lawrence, K.C. and Norman Craig appeared for the plaintiff; and Montague Lush, K.C., Jessel, K.C., and Gatey were for the defendant corporation.

EVE, J., having decided the facts against the defendant corporation, said, with regard to the law, it was contended that the corporation had a common law right to discharge sewage into the sea, and that the fishery is subject to that right. Next they say that they have a prescriptive right to discharge sewage into the Swale. Both those points have been decided adversely to the defendants by Mr. Justice Buckley in "Hobart v. Southend Corporation" [75, L.J., K.B., 305], and by the Court of Appeal in "Foster v. Warblington District Council" [(1906) 1. K.B., 648]. On the law, therefore, I am bound to follow those cases, and to hold that the corporation has no right to discharge sewage into the Swale. Then with regard to the remedy, I was surprised to hear it suggested that the Court ought only to award damages to a flourishing company, such as this is, for injury to its business. It was said that the plaintiff company might alter the course of their business, and by moving the oysters and purifying them might render them fit for the market. This Court would certainly not make the plaintiff company adopt any such course. It is the duty of the Court to grant an injunction.

An injunction with an inquiry as to the damages suffered was therefore ordered.

RECENT PUBLIC HEALTH LITERATURE.

Bacteria.

NORTH (C. E.). A preliminary note on the disinfection of body cavities by injection of suspensions of living nonpathogenic bacteria. *Med. Record, N.Y.* 1908, lxxiii, 989.—SCHWEINITZ (G. E.) and C. A. FIFE. Auto-intoxication. *Jour. Amer. Med. Assoc.*, 1908, l, 2040.

Caisson Disease.

MUMMERY (N. H.). Diving and Caisson Disease. A summary of recent investigations. *Brit. Med. Jour.*, 1908, i, 1565.

Climate.

CARR (J. W.). Health resorts and climates for children. *Practitioner*, 1908, lxxxi, 12.—CHARTERIS (F. J.). The climate and health resorts of Scotland. *Practitioner*, 1908, lxxxi, 73.—FOULERTON (A. G. R.). The climate and health resorts of the South Coast. *Practitioner*, 1908, lxxxi, 50.—HADFIELD (P. H.). Health with pleasure in Norway. *Practitioner*, 1908, lxxxi, 125.—LINDSAY (J. A.). The climate and health resorts of Ireland. *Practitioner*, 1908 lxxxi, 83.—WALSH (D.). The Austrian Tyrol as a health resort. *Med. Press*, 1908, ii, 11.—WEBER (Sir H.). On climates suitable for the aged. *Practitioner*, 1908, lxxxi, 1.

Dairies.

GARSTANG (T. W. H.). The inspection of dairies and cowsheds. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 245.

Diphtheria.

BLUMENTHAL (P.). Beitrag zur Frage der Diphtherieantitoxingewinnung. *Berl. Klin. Wochens*, 1908, xlv, 1229.

Fever.

CLAYTON (F. H. A.). A contribution to the study of seven-day fever of the Indian Ports. *Jour. Trop. Med.* 1908, xi, 184.

Hospitals.

ADAMS (H. P.). Notes on the construction of cottage hospitals. *Brit. Med. Jour.*, 1908, i, 1476.—RICKIN (G.). Home hospitals for the middle classes. *Brit. Med. Jour.*, 1908, i, 1474.—SHAW (L. E.). The future of the voluntary hospital and its relation to a reformed poor-law medical service. *Brit. Med. Jour.*, 1908, i, 1471.

Hygiene, Public.

TREVES (Sir F.). Preventive Medicine at Panama. *Proc. Roy. Soc. of Med.*, 1908, i, *Epidem. Sect.* p. 303.

Infant Feeding.

MACKENZIE (W.). Caloric values in infant feeding. *Intercol. M.J. Australas.*, 1908, xiii, 244.—TULEY (H. E.). Breast and artificial feeding of infants. *Pediatrics*, 1908, xx, 371.

Malta Fever.

EYRE (J. W. H.). The Milroy Lectures on Melitensis Septicæmia (Malta or Mediterranean fever). *Lancet*, 1908, i, 1747, 1826.

Meningitis.

HOCKHAUS (H.). Ueber epidemische meningitis. *Medizinische Klinik*, 1908, iv, 737.—M'DONALD (S.). Observations on epidemic cerebro-spinal meningitis, *Two plates. Jour. of Pathol. and Bacteriol.*, 1908, xii, 442.—MILLER (A.) and S. A. BARBER. An epidemic of cerebro-spinal meningitis, and the successful use of Flexner's anti-serum. *Jour. Amer. Med. Assoc.*, 1908, l, 1975.—SHENNAN (T.) and W. T. RITCHIE. A bacteriological investigation of epidemic cerebro-spinal meningitis. *Plate. Jour. of Pathol. and Bacteriol.*, 1908, xii, 456.

Milk.

KENWOOD (H.). The pasteurisation of milk. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 260.

Opsonins.

HECKTOEN (L.). On the specificity of opsonins in normal serum. *Jour. of Infect. Dis.*, 1908, v, 249.—NEUFELD (F.). Ueber die Grundlagen der

Wright'schen Opsonintheorie. *Berl. Klin. Wochens*, 1908, xlv, 993.—SELLARDS (A. W.). Note on the nature of opsonic immunity. *Jour. of Infect. Dis.*, 1908, v, 309.—TUNNICLIFF (R.). The opsonic index in erysipelas. *Jour. of Infect. Dis.*, 1908, v, 268.

Plague.

BANNERMAN (W. B.). Report on experiments undertaken to discover whether the common domestic animals of India are affected by plague. *Jour. of Hygiene*, 1908, viii, 209.—VERJBITSKI (D. T.). The part played by insects in the epidemiology of plague. *Jour. of Hygiene*, 1908, viii, 162.

Scarlet Fever.

TIKTIN-HAUSEMANN (N.). Ueber das Vorkommen von Scharlach in der Stadt Zürich in den Jahren 1902-1906. *Jahrb. für Kinderheilkunde*, 1908, lxxvii, 641.

Schools.

CUMPSTON (H.). School hygiene in Australia. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 274.—ELKINGTON (J. S. C.). School hygiene in Tasmania. *Jour. Roy. Sanit. Inst.*, 1908, xxix, 285.—VANDEGRIFT (G. W.). The new school hygiene. *Med. Rec. N.Y.*, 1908, lxxiii, 986.

Serum.

CARAPPELLE (E.) and A. GUELLI. Ueber die Anpassung der Bakterien an die bakteriolytische Eigenschaft des Blutserums. *Centrab. für Bakteriologie*, 1908, xlv, (Orig.), 632.—KRUMLEIN und P. SCHATILOFF. Untersuchungen ueber das Meningococcen serum. *Deut. Med. Wochens*, 1908, xxxiv, 1002.

Tropical Medicine.

ASHFORD (B. K.). Puerto Rico as a field for research in tropical medicine. *New York Med. Jour.*, 1908, lxxxvii, 1236.

Tuberculosis.

GILLIES (S.). On the value of the ophthalmic-reaction in the diagnosis of tuberculosis. *Australas. Med. Gaz.*, 1908, xxvii, 216.—KAUFMANN. Experimentelle Prüfung des Desinfektionwertes von Rohlysoform für die Wasche und der Autans für die Wohnräume Tuberkulose. *Zeit. für Tuberkulose*, 1908, xii, 393.—KLIMMER. Das Dresdner Verfahren, Rinder mit Wille nicht infektiöser Impfstoffe gegen die Tuberkulose zu immunisieren. *Zeit. für Tiermed.*, 1908, N.F., xii, 81.—V. RUCK (S.). Modes of infection in tuberculosis. *Boston Med. and Surg. Jour.*, 1908, clviii, 900.—STOWELL (W. L.). The relation of tuberculous cows to tuberculosis in children. *Medical Rec., N.Y.*, 1908, lxxiii, 1023.

Typhoid Fever.

MABEE (O. R.) and A. E. TAFT. The early diagnosis of typhoid fever by blood cultures from the ear. *Bost. Med. and Surg. Jour.*, 1908, clviii, 863.—SANBORN (G. P.). Anti-typhoid inoculation. *Bost. Med. and Surg. Jour.*, 1908, clviii, 864.

Typhus Fever.

BUSSE (O.). Ueber des Vorkommen von Typhusbazillen im Blute von nicht typhuskranken Personen. *Münch. Med. Wochens*, 1908, lv, 1113.—COHOE (B. A.). The placental transmission of bacillus typhosus, with report of a case. *Amer. Jour. Obstet.*, 1908, lvii, 789.—HEPPER (E. C.). An outbreak of typhus fever in Peshawar. *Indian Med. Gaz.*, 1908, xliii, 205.—HUSBAND (J.) and R. C. MACWATTERS. Typhus fever in Northern India. *Indian Med. Gaz.*, 1908, xliii, 201.

Vaccination.

MARSCHIK (H.). Vaccine der Mund und Rachenschleimhaut. *Weiner Med. Wochens*, 1908, lviii, 1233

Yellow Fever.

AGRAMONTE (A.). An account of Dr. Louis-Daniel Beaupertuy, a pioneer in yellow fever research. *Bost. Med. and Surg. Jour.*, 1908, clviii, 927.—GORGAS (W. C.). Method of the spread of yellow fever. *Medical Rec., N.Y.*, 1908, lxxiii, 1061.

Public Health

THE JOURNAL OF THE

Incorporated Society of Medical Officers of Health.

No. 7.

SEPTEMBER, 1908.

VOL. XXI.

THE YORKSHIRE MILK REPORT.

WE would specially direct the attention of our readers to the review, in our present issue, of what must be regarded as one of the most valuable documents that have ever been published on the subject of the milk supply. The great towns of the North of England have long been honourably distinguished by the efforts, both in investigation and administration, that they have put forth to secure a wholesome supply of milk; and the seven Yorkshire authorities to whom we owe the present report, are to be heartily congratulated on having furnished a series of facts that are of great importance to the public health, and will be found useful in all parts of the world where the question of the milk supply is a matter of public concern. The report reflects credit on all who have been engaged in its production, and especially on Dr. Orr, the bacteriologist, of whom we expect to hear a good deal more in the future.

The conclusions of the Joint Committee who have issued the report are based on numerous careful and precise observations. They find that serious contamination of milk does take place, that the greatest contamination occurs in the cow-shed, and that the contamination is "to a great extent of a preventable character." It is important to note in what direction the Committee look for preventive measures. They do not agree with those who appear to regard milk reform as primarily a matter of cow-shed construction; they point out, for instance, that the ventilation of the cow-shed, "although important as regards the health of the cows, has no very direct bearing upon the degree of contamination suffered by the milk in the cow-shed." The preventive measures the Committee recommend are chiefly measures of personal hygiene, depending on the habits and ways of the milkers:—cleanli-

ness of the milker's hands and person; washing the cow's udder and flanks with soap and boiled water before milking; rejection of the first draw of milk from each teat; avoidance of any dust-raising work immediately before or during milking; efficient sterilisation of all vessels by steam or boiling water; removal from the cowshed of the milk of each cow immediately after it has been drawn. These are excellent recommendations, but it is, to say the least, doubtful whether the observance of the precautions thus laid down can reasonably be expected of the present generation of milkers, of those habits the report furnishes some lurid illustrations, and it is not improbable that it may be necessary to introduce a new class of milkers, drawn from a higher social grade, who will be clean, not from external compulsion, but because "it is their nature," and who, of course, will demand higher wages. Whether such changes can be effected, with milk at its present price, in the absence of a complete re-organization of the milk industry, is a matter that calls for more consideration than it has hitherto received.

The report, valuable and instructive as it is, takes us little nearer to the answer to the question of farm or milk pollution in the causation of epidemic diarrhoea. Dr. Orr has shown, it is true, that it is at the farm that milk receives its chief contribution of dirt, of organisms in general, of glucose fermenting organisms, and of *B. enteritidis sporogenes*; but while we are still ignorant of the nature of the organisms, whatever they may be, that give rise to epidemic diarrhoea, most epidemiologists will hold that the facts brought forward in the report do not shake Dr. Newsholme's conclusion that, in this disease, the specific pollution is derived from the home. There is still much to be learned about milk and disease, and we hope that the publication of the Yorkshire milk report will stimulate other local authorities to institute similar inquiries.

THE LATE DR. T. ORME DUDFIELD.

THE world of preventive medicine has suffered a heavy loss by the death of Dr. T. Orme Dudfield, the Medical Officer of Health of Kensington, who died on July 30th, in the 76th year of his age. Dr. Dudfield, who, after the death of Dr. Woodforde last spring, was the oldest Medical Officer of Health actually holding office, was appointed to his post at Kensington in March, 1871, and he discharged the duties of his office almost to the end of his life. For many years he was one of the foremost personalities in the public health service, and his influence extended far beyond the borders of his own district. To his initiative, zeal, and energy, which continued unabated until within a few weeks of his death, the public owe many sanitary reforms. It was largely due to his influence that smallpox hospitals were removed from the London area, and that the stigma of pauperism was taken from the patients in the hospitals of the Metropolitan Asylums Board. He was a great public servant, and his career affords a fine example of what a medical officer of health may make of his work.

Dr. Dudfield was keenly interested in the welfare of the Society of Medical Officers of Health. He joined the Society in 1871, became a member of the council in 1873, and was president of the Society in the sessions of 1883-4 and 1884-5. He was the Society's representative on the Sanitary Inspectors' Examination Board since the Board was incorporated in 1899. He read several important papers before the Society, the first being one on scarlet fever in 1873. It was at his suggestion, made in December, 1891, that the Society became incorporated, and he was one of the nine "first members," described in the original Articles of Association. At the interment, which took place at Brompton Cemetery, on August 1st, the Society was represented by the secretary and the treasurer.

Dr. Dudfield's career exercised considerable influence on the development of British public health administration, and in a future number of this Journal, we hope to give an account of his life and work.

THE SALARY OF A PART-TIME MEDICAL OFFICER OF HEALTH.

DR. MONCKTON COPEMAN'S report to the Local Government Board on the "General Sanitary Circumstances and Administration of the Brixworth Rural District," contains an interesting account of a struggle between the Local Government Board, and the Brixworth Rural District Council, the subject of contention being the salary of the council's medical officer of health. It appears that in 1903 the council obtained the sanction of the Board to increase the salary of their medical officer of health from £50 to £70 per annum, and that when the medical officer resigned his post in August, 1906, the council proposed to appoint his successor at the original salary of £50. To this the Board demurred, pointing out that the salary of £70 per annum "could not be regarded as affording more than an adequate remuneration for the proper discharge of the duties of medical officer of health in a district of the size and population of the Brixworth Rural District," the population being 11,829 persons, and the area 61,766 acres. In spite of this letter and of further correspondence, the council remained obdurate, and, in consequence, the Board, on Oct. 24th, 1906, informed the council that they were not "prepared to sanction an appointment at that salary (£50) with a view to repayment from the county funds." The council then appears to have maintained a discreet silence, and the matter remained shrouded in darkness until July, 1907, when the Board received a letter from a Brixworth doctor stating that he had been appointed medical officer of health of the Brixworth Rural District at a salary of £35 a year. The Board, however, were equal to the occasion. They immediately wrote to the clerk to the district council asking for particulars of the appointment, and, when these had been received, decided that as "further correspondence was unlikely to be productive of satisfactory result, local investigation was desirable," and Dr. Copeman was instructed to make the necessary inquiries. Brixworth is not unaccustomed to inspection by the officers of the Board, for it was visited in 1874 by Sir Richard Thorne Thorne, in 1885 by Dr. Parsons, and in 1889 by Dr. Bruce Low. These inspections revealed serious sanitary shortcomings, which, according to Dr. Copeman's report, are still far from being remedied. The matter throws light on rural sanitary administration, and it will be interesting and instructive to note how it ends.



*Yours sincerely,
T. Orme Dudfield*

RIVER WATER SUPPLIES AND FILTERED WATERS.

By A. E. THOMAS, M.B. (Oxon.), D.P.H.,
Medical Officer of Health of the City of Chester.

WATER is one of the prime essentials of life, and during recent years considerable attention has been directed to its acquisition in a pure and a palatable condition. The chief recognised sources of its supply are deep or superficial wells, lakes, springs, and rivers—the choice depending frequently upon the exigency of some topographical or economic consideration.

It is to be marked that latterly river supplies have tended to fall into disrepute, so that large centres of population eschewing river-sources, have sought to acquire their water elsewhere—notably from large inland lakes.

The object of the present paper is to consider the question of rivers as sources of water supply, to ascertain how far they may be deemed satisfactory as such, and the safeguards which it may be necessary to impose for their adequate protection.

The subject may be treated under four heads—Topographical, Chemical, Bacteriological and Epidemiological.

Topography.—Provision of reservoirs, and the control and inspection of river courses and banks.

Reservoirs.—If the stream be small, the erection of a reservoir may be contemplated in its course. In this case the whole of the proposed gathering-ground should be most thoroughly examined with the aid of a geological and ordnance map for the presence or absence of fissures, swallow holes, old or recent landslips, geological faults, masses of shale, drift or boulder clay, and permeable intrusive beds delving out into lower ground and giving exit to the water falling on them. The presence of any one of these may render the construction inadvisable at the outset. The site should lie over impermeable strata or within short distance of them from the surface; the sides should be as nearly vertical as possible and gently concave, so that in vertical cross-section the valley should resemble the cross-section of a ship. The lower end of the valley should preferably be near a gorge, permitting of easy closure by brickwork or masonry. It is advisable to ascertain whether there are any peat beds in the reservoir site, so

that the necessary correction to the supply for acidity may be made by subsequent chemical or other treatment.

A sample of the water should be taken for analysis. When the site has been approved, it becomes necessary to safeguard and abolish the possibilities of pollution.

This may be achieved by removing all the occupiers by purchase, prohibiting cattle grazing, closing all footpaths, fencing in the site, diverting any drains or sewers already discharging into the valley into districts outside the gathering-ground, and felling or clearing any woods, forests, or cultivated land.

If the price of this be prohibitive, much may still be done by imposing rigid regulations on the occupiers of neighbouring farms, and by close and constant supervision. Where the possibility of contamination appears doubtful, positive evidence may often be obtained by sewing the impugned area with fluorescein, common salt, *B. prodigiosus*, or *B. violaceus*, and making periodic examination of the river-water on the site of the proposed reservoir.

Although the acquisition of the land in this connection may seem a small matter, it is remarkable what an interminable number of interests have to be acquired before opposition to a projected scheme is silenced. Thus, in a recent parliamentary bill, the following were among the considerations for which compensation was either sought or paid:—various easements, mineral, riparian, navigation, fishing, shooting, coursing, and game preserving rights; the rights of mill owners, factory owners, canal owners, and owners of woods and forests; the rights of fishery conservators, and pisciculturists; closure of rights of way; compensation for water and damage to collateral water supplies; breaking up of roads and bridges and consequent displacements and settlements of the contained gas and sewage pipes; payment for extra police drafted into the district to control the workmen while the construction was in progress.

Inspection of River Banks and Course.—This is a most important part of the care and control of a water supply—probably the most important part of all the measures adopted. It is the only one, which, with the one last described, gives information as to the liability of a supply of pollution.

Chemical and bacterioscopic examination may, and will give a posteriori evidence of pollution already affected, but are dumb as to a priori indication of possible pollution.

This liability to contamination, though often a matter of great difficulty, is only revealed by topographical inspection, and for this reason the physical examination of river banks, and river-bed, right up to mountain stream, and source should never be omitted.

Both banks should be traversed on foot, the stream by boat. The examination should be conducted during fine weather, after heavy rain, during flood, and at time of high tide if the river be tidal.

Many intermittent sources of pollution are only detected at one or other of these times. For example, the manure deposited on fields, and the sludge from the sewage settling-tanks of small villages frequently give no evidence of their existence in mild equable weather, but are carried into the stream at times of heavy rain. Every tributary, and every ditch should be followed up as far as possible, and its liability to pollution noted, and the necessary preventive measures instituted. Every thicket, every collection of brushwood on the bank should be critically examined for concealed drainage or sewage outlets. Sometimes an oily scum on the river surface indicates the near presence of a gas or chemical works. So, too, a persisting local discolouration in the water, or a hummock, or other disfiguration of the river bank discloses the drainage route of a neighbouring farm, village or factory—the pipes themselves being continued along the river-bed into mid-stream, and, therefore, out of sight. Where a source of pollution is suspected only, the ground should be sewn as before with some aniline dye, preferably fluorescein, or some chromogenic organism as *B. prodigiosus*, *B. violaceus*, or *B. pyocyaneus*, and control examination made from the stream itself. Samples must be taken from each tributary at its point of junction, and from any liquor discharged into the river, as for example, from the outfall of a sewage works. For it has to be remembered that even with an elaborate bacteriological treatment of sewage, there is always a large number of organisms left in the final effluent. Thus, to take an example in Chester sewage, there were found per one cubic centimetre—

CRUDE SEWAGE.

Gelatin count	...	...	2,250,000
<i>B. coli</i>	...	...	460,000

After treatment in settling-tanks and passage through a bacteriological clinker filter—

Gelatin count	...	...	1,600,000
<i>B. coli</i>	...	...	175,000

After passage of the last filtrate through a second set of filters (clinker and polarite)—

Gelatin count	...	...	450,000
<i>B. coli</i>	...	...	135,000

These results show that in the final effluent there remained on the gelatin count 20 per cent., and on the *coli* count roughly 30 per cent. of the organisms originally present in the crude sewage.

The influence of a flood, even of small amplitude, in transporting polluting material is most markedly shewn by bacterioscopic examination. Thus, on four successive days, the counts were:—

1. Gelatin count, 1,500; *B. coli*, 12.
2. Gelatin count, 19,420; *B. coli*, 196—slight fresh water flood.
3. Gelatin count, 3,470; *B. coli*, 12—flood almost receded.
4. Gelatin count, 1,640; *B. coli*, 15—flood absent.

The influence of tidal flow is often fallacious—it must not be too hastily assumed that the highest tide is necessarily attended by the highest displacement upwards of the waters in the lower reaches, and, therefore, by the most aggravated pollution of the water supply in the case where the lower river is the receptacle of sewage effluents. For bacteriological examination shows that this displacement is the hydrodynamical resultant of two forces, flood and tidal, so that a moderate flood and a high tide may produce less upward movement than in the case of a low tide and no flood. Indeed, in the former case there may even be found a large sheet of water over which, from bacteriological examination, sedimentation is taking place, and therefore possibly little or no movement of translation. These observations are borne out by float experiments.

Enough has been said to show what an important matter the actual inspection of the river-course is. And it should not merely be periodic, but a constant patrol, for it is only by this means that intermittent sources of contamination—as for example pleasure boats and house boats, dead dogs or other animals—can be detected, and stringent measures and regulations be adopted and enforced to meet the circumstances. Occasionally, special inspections become necessary, as for example, when the bacterioscopic count shows a sudden high increase, unaccounted for by flood or tide—a tour of the river may then show the accidental bursting of a septic tank or passage of accumulated sludge. So again, to take another actual

case—a sudden acquisition of a yellow tint by the water was found to be due to the accidental discharge of waste from an iron works. The following are enumerated as actual examples of polluting agents revealed by the examination of a river-course in the manner described above—

1. The Raw sewage of villages and towns.
2. Effluents from sewage works.
3. Privies, public urinals, railway water-closets discharging directly over the stream or piped into the river-bed.
4. Overflow and discharge from cesspools, cesspits, privy middens, and sewage settling-tanks.
5. Discharge from sewer storm outfalls.
6. Refuse from manure pits and dung heaps.
7. Fluid filth from piggeries and cow sheds.
8. Refuse, blood, and offal from slaughter-houses, and knackers' yards.
9. Refuse from tanneries, skinners and curriers' yards.
10. Waste from collieries, tin-plate works, steel works, soap and candle works, breweries, factories and chemical works.
11. Liquor from gasworks.
12. Refuse from manure works, and offensive trades.
13. Slop water, house garbage and solid refuse, discarded boots, tins, dishcloths, crockery, ashes, old iron, stale fruit and fish, straw, old boots, old hats, worn-out clothes, egg-shells, cabbage stalks, potato peelings, bottles, soap-suds and bones.
14. Refuse from sheep washing.

The number and variety of the above demonstrate the need of constant supervision and incessant action for their prevention and suppression.

Chemical Examination.—This has no longer the importance formerly attached to it, inasmuch as its indications are merely relative; and the results admit of correct interpretation only by reference to local standards rigidly tabulated over a long period of time. Chemistry does not present a fixed absolute standard, which will hold for all waters; the local circumstances, the source, site and environment of the supply must be furnished before a reliable opinion can be given as to the purity of a sample. There are said to exist in water supplies two well-defined groups of organisms

—the one analytic, and reducing nitrates and nitrites to ammonia; the other synthetic, or oxidizing and converting ammonia into nitrites and nitrates.

And it is on the relative predominance of one or other of these groups that the water may contain excess of ammonia, or excessive nitrites and nitrates. And on this slender basis, the possibility of the ascendancy of one or other of these groups, opposite in chemical effect it would appear to be difficult if not impossible to ascertain the existence of "previous sewage contamination."

For it must be remembered that many waters, and especially polluted waters change chemically quickly after collection. It must be conceded, however, that in surface waters, ammonia and nitrites are scarcely ever present to any very appreciable extent without sewage contamination. In some interesting experiments, Dr. Thresh showed that the addition of 1 per cent. of tea infusion to ordinary potable tap-water, rendered the water on chemical standards more impure than the addition of the same percentage of sewage under similar conditions. And from an investigation conducted by Drs. Houston and Klein, for the Local Government Board, it would appear that in respect of small amounts of pollution, no water can be said to be absolutely free from sewage contamination, as the result of chemical analysis, although such pollution might be easily ascertained by bacterioscopic examination. Nevertheless, great variations in the chemical results may suggest pollution. And for the estimation of saline constituents, and objectionable salts, chemical methods are indispensable.

The best control of the water supply is not chemical examination, but by actual physical inspection of the source, and bacteriological examination—measures which give evidence of pollution proceeding even minute in degree, and the liability to it.

Bacteriology.—The bacterioscopic examination includes:—

1. The number of colonies developed at 20° C. or 21° C. on a gelatine plate, and derived from one cubic centimetre of the water—the counts being made at 48, 72 and 96 hours after plating—earlier if liquefaction be imminent.
2. The number of colonies developed at 37° C. on an agar plate.

3. The number of *B. coli* found in one cubic centimetre, or if absent in this amount of water, its presence or absence in 10 cc., 50 cc., and 100 cc., of water.
4. The presence or absence of *B. enteritidis sporogenes* in 1 cc., 10 cc., 50 cc. and 100 cc. of water. This investigation may be omitted as part of the routine adopted.

The enumeration of colonies raised at an early period, the question of numerical standards.

A consideration of two such arbitrary tables—

	Macé.	Miquel.
Good water ...	200 or less	1,000 or less per 1 cc.
Passable water ...	200—500	1,000—10,000 „
Impure water ...	500—1,000	10,000—100,000 „

shows what contradictory conclusions might have been drawn by the adoption of one or other of these.

For waters subjected to sand filtration, however, Koch's original standard is still observed—the gelatin count per cc. at 20° C. in 96 hours must be less than 100. It was found that while a small gelatin count might indicate high purity, it did not necessarily follow that a high gelatin count was associated with objectionable pollution. It is the quality, not the quantity, of organisms present, which tells of possible danger.

Further research discovered that the number of organisms in water varied with:—

1. The velocity of the flow.
2. The facility for sedimentation.
3. The absence or presence of purer waters as diluting agents.
4. The absence of violent changes in the flow of the stream, e.g., by flood or tide.
5. The quantity of food material present.
6. The season of the year; the count in summer being less than that in winter.
7. The character and nature of the source of supply.

The discrepancies in the results obtained by different investigators in the examination of the same water were found to be associated with differences in some or all of the following factors.

1. The composition of the culture medium, the percentage of peptone and its variety, the presence, absence or amount of sodium chloride and other salts.
2. The chemical reaction of the medium.

3. The time and temperature of incubation.
4. The kind of glass used in the Petri dish.
5. The site from which the sample was taken—the count in the middle of a stream being often lower than that at the sides, and under a bridge higher than that in the open stream.

Other difficulties were encountered in attempting to define *B. coli*. Drs. Gordon and Houston have shown that there are a large number of kinds of this organism, and the latter has standardised the so-called “flaginac” type, meaning thereby a microbe, which—

fl—gives fluorescence of a green colour in neutral red broth.

ag—develops acid and gas in lactose peptone.

in—forms indol in broth.

ac—gives rise to acid and clotting in litmus milk.

In addition, Houston examines the growth on gelatin and the formation of gas in a glucose gelatin shake culture. As a precautionary measure, it is advisable to keep the growth on gelatin slope for four weeks to ensure the absence of late liquefaction.

For bacterioscopic examination, samples should be taken from the raw river water, each of the sand filters, the pure water tank, the service reservoir, and from taps in various parts of the town, both without previously sterilising the taps, and after doing so, in the first, so that an estimate may be formed as to what the consumer actually gets in practice; in the second case, for the purpose of comparing local peculiarities in the lines of distribution in different parts of the supply. For effective control, samples should be taken daily; if not daily, as often as may be convenient. By this means of bacteriological control, it is possible to solve many problems, thus, by varying the depth and kind of sand, the size of the grains, and the closeness or looseness in packing to ascertain the best filtering medium for the local supply.

An efficient sand filter will remove over 99.5 per cent. of the organisms present in the raw water and give a gelatin count below Koch's standard of 100 per cubic centimetre. By this method, too, it is easy to determine when a sand filter requires cleaning and whether a high filter count is due to a fault in the sand or some of the fittings, e.g., a tap, washer, or conduit.

To take actual cases—the gelatin counts per one c.c. were:—

	1.	2.	3.
Raw river water ...	1,044	1,658	7,400
Filtered water, bed A. ...	2	0	3
“ “ B. ...	2	0	399
“ “ C. ...	105	21	Off for cleaning
“ “ D. ...	2	1,208	2
“ “ E. ...	Off for cleaning	Off for cleaning	31
“ “ F. ...	7	3	Off for cleaning
Pure water tank ...	23	1	638
Tap in town, previously sterilised.	40	55	141

In the first we see that the filtered water from bed C contains 105 organisms per c.c., which exceeds Koch's standard of 100, and also shows roughly only a reduction of 90 per cent. on the count in the raw river water.

This bed then fails in two respects and probably requires cleaning, washing, or aerating. Again, the pure water-tank into which the supplies from all the filters converge presumably in equal quantities has a count of 23, which is the average of the counts in all the filters, thus confirming the opinion that the fault in bed C lay in the filtering medium itself.

In the second example, the high count from Bed D, and the low count in the pure water-tank show that the high count referred to was purely local, not transmitted over to the pure water-tank, and therefore not due to a fault in the sand, but possibly to a defective or worn washer in the filter tap. The usual remedy in these cases is to remove the filter tap temporarily, examine the washer and, if defective, repair or insert a new one, then sterilize the whole tap by boiling and replace in the filter side.

The third example is rather a difficult one—the average of the four filter counts is 109—not far removed from 141, the count in the town supply, so that in all probability the sand medium of Bed B has proved defective. The approximation of the filter average to the town supply, and the large discrepancy between these two, and the count in the pure water-tank suggest that in the latter the defect is purely local, not transmitted into the town water or public supply, but probably due to a defective tap.

A desirable qualitative standard in filtered

waters is that *B. coli* be absent from 100 cc.—it must be remembered, however, that the presence of *B. coli* in any definite amount of water is an index of potential danger only and not in any sense a measure of the disease valency of the supply.

Further, that though it may be conceived that the degree of potential danger to health associated with any supply is roughly proportional to the number of typical *B. coli* present, yet it is quite possible that, even if *B. typhosus* were originally present, the subsequent presence of *B. coli* is no proof that *B. typhosus* would have survived under parallel circumstances. In other words, one cannot argue from *B. coli* to *B. typhosus*.

It is essential that samples should be taken for analysis from river and from every tributary, both before and after rain, and in the case of any high bacterial count a search should be made for a possible polluting agent.

Filter Beds.—These should be of fine sand preferably, graded, and not less than four feet in thickness. The sides are best vertical and fairly deep, thereby keeping the water cooler in summer and preventing excess of vegetable growth. Recently it has been proposed to adapt sprinkling filters with revolving arms to the purification of water supplies. The rate of filtration should not exceed four inches vertical displacement per hour. The action is partly biological, partly mechanical, the schlamm-decke or surface jelly consisting of algæ (chiefly green in spring, blue in summer), desmids, diatoms, infusoria, and the zooglea of bacteria. Factors which impair the efficiency of the working are frost, cracks in the adjoining ground leading to concealed faults in the filter sides, excessive foliage, young eels, sticklebacks, and the larvæ of gnats.

The filters should be capable of working independently, and should be fitted with automatic rate-equalising regulators.

Various methods of aerating and cleansing are in use. At Lincoln it was the practice to rake as far as possible from the sides of the filter, standing on the bank, thus leaving a rectangular portion in the centre untouched and overworking the raked portion. Another method is for workmen to turn over the sand, beginning at one end of the filter and working towards the opposite end, displacing the sand towards the first end as they progressed towards the other, eventually producing an unequal distribution.

An excellent method is to draw a heavy rope backwards and forwards over the surface of the sand, its ends being held by workmen on opposite sides of the filter bed.

The sand is washed in inverted and truncated cones, being violently agitated during the process. When new sand is placed on a filter, the filtered water should be run off for a few days; the interval is best determined for this and other investigations, *e.g.*, as to the best filtration rate by actual bacterioscopic count.

The filter is refilled from below until the water is level with the upper surface of the sand, when the supply is run in from above.

Storage.—The provision of facilities for sedimentation is vitally necessary in the case of a river supply. It has long been known that the bacterial count per cubic centimetre is by sedimentation very much reduced, and Houston has shown further that storage not only lessens the number of organisms present, but also weakens, or even abolishes, their positive biological attributes, so that it is likely that even a specifically polluted supply, after sufficient storage, may be potentially harmless. In other words, while filtration reduces the number of bacteria in a supply, storage tends to make them degenerate and harmless. A familiar case of such degeneration is that of the typhoid bacillus, which, by culture in media containing certain aniline dyes, may become bereft of its flagella. The best interval of time for storage, and the investigation of local stagnating areas in the storage reservoirs, may be best ascertained by experiment and bacterioscopic count, using either the water supply as it is or using control tests with a chromogenic organism. The storage reservoir should be capable of holding not less than thirty days' supply.

Epidemiological.—At the present time very little is known of the correlation of disease with known diversions from the normal conditions of a water supply as determined by bacteriological or chemical examination, though in a broad general way it may be stated that the enteric mortality and number of enteric notifications run parallel to the water purity curve.

The outbreak of *enteric* fever in Altona in February, 1892, was preceded in January by a sudden increase of the number of organisms in the filtered water from below 100 to over 1000.

The outbreak of cholera in the town in January and February, 1893, was also preceded by an increase in the bacterial count in the filtered waters.

In both these cases, specific germs had gained access to the filters and these latter had broken down.

The history of this last outbreak is instructive. Hamburg and Altona obtained their water from the Elbe, the Hamburg intake being above the city, the Altona intake being below Hamburg and liable to pollution by Hamburg's sewage.

The Hamburg water was not filtered, but delivered raw to the consumer—the Altona water was filtered. Hamburg was first attacked by cholera, and Altona at first more or less escaped. Later, cholera suddenly broke out in Altona, and careful search elicited the fact that at the same time the filtering arrangements had seriously broken down.

Epidemics of enteric fever in Bangor (1882) and Chester-le-Street (1892-3), were also ascribed to filter beds becoming defective.

These occurrences show that filter beds in themselves are not an absolute safeguard. They constitute one line of defence only, and should be supplemented by sufficient reservoir accommodation, both for sedimentation and for pure water storage.

In a supply derived from a river, unless the stream is free from even the risk of pollution—a consummation beyond the dreams of sane health officers—filtration alone is quite insufficient, and has on more than one occasion been shown to be inadequate.

It may be asked, supposing the water supply becomes infected with specific organisms, what measures may be taken to make it again harmless.

In Lincoln, where an organism indistinguishable from *B. typhosus* was found in the town's water, a solution of sodium hypochlorite (chloros) was added to the water proceeding to the filters, so as to form approximately a 1/10,000 solution at first, and later 1/20,000, and to the pure water reservoir at the rate of 1 in 100,000.

Calcium chloride was added to the pure water-tank to prevent free acid passing into the supply. Live gold-fish were kept in the fresh water-tank. The water was tested for free chlorine with starch and potassium iodide, and also for lead.

As an additional precaution, the workmen

employed at the waterworks were tested for the Widal reaction to detect unrecognised cases of enteric fever, and were kept under close medical observation.

To sum up, the safety of a water supply depends upon:—

1. The purity of the source, and its freedom from possible pollution. In this respect, rivers fail notoriously.
2. The control of the source by constant inspection, and the imposition of stringent regulation. Here again in practice this is most difficult indeed, almost impossible in the case of rivers.
3. The provision of sufficient sedimentation accommodation. In many rivers this most vital essential is ignored.
4. Efficient filter beds, and the bacteriological control of such. These are liable to become defective, and in the absence of sedimentation beds are not a sufficient protection.
5. Sufficient storage accommodation for pure water. This is often absent, and even when provided generally inadequate.
6. The previous epidemiological history of the supply.

There can be no question, I think, that on the whole, river supplies are generally precarious, and may become dangerous—it has been asserted that no river is long enough to purify itself, and yet there is no doubt that most rivers undergo some amount of purification in their course.

On the other hand, there is the experience of large towns like London, which have been for many years drinking water derived from sources notoriously polluted without incurring the onset of any large epidemic.

On the whole, it is advisable where rivers supply towns, to err on the side of safety, and to insist upon the provision of efficient filtration bacteriologically controlled, and sufficient sedimentation beds and pure water reservoir accommodation; anything short of this is a risk not to be contemplated with equanimity, and sooner or later to court possible disaster. In compiling this paper, free use has been made of the writings of Drs. Houston, Gordon, Thresh, Savage, Horrocks, Prescott, and Gage.

YORKSHIRE MILK.*

By J. SPOTTISWOODE CAMERON, M.D.,
Medical Officer of Health, Leeds.

MUCH good work is being done, especially in America, in studying the changes which occur in commercial milk, and a vast amount of information on the subject is available to any diligent collector. It is a good sign of the time, however, when local authorities themselves undertake an investigation in the interests of the public health. Such an investigation has been carried on for a twelve-month in Yorkshire, and the results have been issued in a report extending to 113 foolscap pages of letterpress and tables. The first five pages consist of the report of the joint committee of Yorkshire authorities, and contain the conclusions to which they have come; while the remaining pages, forming the bulk of the publication, consist of the report to the joint committee of the expert bacteriologist whom they commissioned to conduct the investigation on the lines they laid down.

I.

How the Inquiry originated.—Some two years ago, Dr. Mitchell Wilson, the able and experienced medical officer of health to the East Riding County Council, directed the attention of his authority, whose district lies chiefly in a quite agricultural neighbourhood, to the importance of looking into the whole subject of milk production from a sanitary point of view. Later he addressed a memorandum to the county and county borough medical officers of Yorkshire. The East Riding Council, impressed with the importance of the subject, conferred with the Council of the West Riding, whose district embraces not only a considerable area of a largely agricultural character, but also a large urban population, in the villages and smaller towns, where the woollen industry flourishes. It was then suggested that the large county boroughs, to whom so great a portion of the farmer's milk is sold, might with advantage be asked to join in any inquiry, and a circular was sent to the councils of all the county authorities in

* Report on an Investigation as to the Contamination of Milk, carried out on behalf of the Councils of the County Boroughs of Bradford, Hull, Leeds, Rotherham and Sheffield, and the Administrative Counties of the East and West Ridings of Yorkshire. Copies of this Report (Price 2s. 6d.) may be obtained from the Clerk of the Council, County Hall, Beverley.

Yorkshire asking them to send delegates to a conference on the subject. This conference, which was held in Leeds, on the 23rd of July, 1906, was attended by representatives of most of the county authorities in Yorkshire and their medical officers of health, and the conference recommended that a joint investigation should be conducted, with the aid of an expert, to ascertain if any contamination of milk occurred, and, if so, at what stages of its journey from the cow to the consumer, and what was the extent and nature of the contamination. This recommendation, with certain resolutions as to the general conduct of the proposed inquiry, was transmitted by the clerk of the East Riding County Council to the several authorities represented, and the councils of the East and West Ridings, and those of the cities, or county boroughs, of Bradford, Hull, Leeds, Rotherham and Sheffield, agreed to join in the investigation, and to share the estimated expense of £500, according to their rateable value. When these authorities had appointed their representatives (one from each authority, along with the medical officer of the authority), they, along with the chairman of the Joint Farm Committee of the Ridings, the Professor of Agriculture, and the Lecturer on Agricultural Chemistry at the Leeds University, met, agreed on certain lines of action, and proceeded to advertise in the agricultural and medical journals for an expert bacteriologist willing to undertake the investigation. Several very promising candidates offered themselves, and the joint committee unanimously decided to offer the appointment to Mr. Thomas Orr, of Hamilton, who had, in the laboratory of Dr. Buchanan, bacteriologist to the Glasgow City Council, already studied the bacteriology of milk. The committee, in their own unanimous report, speak very highly of, and the printed report submitted to them, which they have given in full, speaks even more highly to, the excellence of Dr. Orr's work.

The lines of the Inquiry.—Having settled on the bacteriologist, the committee conferred with him upon the lines of inquiry already generally agreed upon. From the first their intention was to carry out the original suggestion of Dr. Mitchell Wilson, of following a particular consignment of milk from the cow to the consumer, measuring the amount of its bacterial content at every stage on the way. From the first also it was evident to those of the committee conversant with the

bacteriology of milk that such a series of examinations might lead to absolutely valueless results, unless some system of testing control samples could be devised. For instance, a sample of milk secured at the cowshed from the churn in which it would travel to one of the larger towns, placed in ice, and, sent to the laboratory for examination, might be found to contain say "a" bacteria per cubic centimetre. At the householder's doorstep in the town, a second sample of the same consignment might be obtained, put into ice, and also sent to the laboratory, and found to contain "b" bacteria per c.c. It would obviously be unfair to say that the increase of bacteria, due to faulty handling of the milk after it left the farm, was represented by either b-a or b/a. Obviously some control of the experiment would be necessary. The most obvious suggestion to meet this difficulty was to take a second sample at the farm and convey it to the point of delivery to the consumer, subject to the same conditions of time and temperature as the milk in the farmer's and retailer's cans. To illustrate by an example. The first country milk examined by Dr. Orr (No. 7 in his cowshed list), contained in each c.c. 85,130 organisms, capable of growing on gelatine at ordinary room temperatures. A sample of the same consignment of milk was obtained at the retailer's premises three hours later (9.45 a.m.), and gave rise under the same circumstance, to 116,000 colonies, an apparent increase of colony-producing bacteria of 36 per cent. (pp. 37 & 100). But a second sample of milk had been placed at the farm in a second sterilised bottle, and instead of being sent in ice to the laboratory direct, was carried in the pocket of the inspector to the town, until the retailer's milk was sampled three hours later at his own premises. Curiously enough the bacterial content of this sealed milk, not iced till the time of procuring the retailer's sample, was 117,160 per cubic centimetre, instead of 116,000. The bacteria in the retailer's sample had increased just over 36 per cent., those in the sealed sample carried in the inspector's pocket had increased nearly 2 per cent. more. The actual 2 per cent. of further increase is perhaps a negligible quantity. What is clear is that the increase of 36 per cent. in the milk in the retailer's possession could not logically be ascribed to fresh pollution on the way, when the control showed an equal (in reality a slightly increased) multiplication of bacteria. In this instance, which is selected simply

because it is first on the list, the milk had been passed over a cooler at the farm, but this had only reduced the temperature of the milk to 23.5° C. (=74.3° F.), though the temperature of the air at the time of sampling was 4° C. (=39° F.). Even this amount of cooling might do something to inhibit the growth of bacteria already in the milk of the churn. But in the case of the retailer, the cool place in which the milk had been placed (8.5° C. = 47.3° F.) had probably reduced the temperature of the milk still further, for when the retailer's sample was collected, its temperature was recorded as 11.5° C. (=52.7° F.) or 12° C. (=21.6° F.), lower than when it left the farm (p.100). The cooler keeping-place of the retailer probably accounts fully for the 2 per cent. less increase in his than in the control sample. This example, however, illustrates the difficulties of what at first sight looked a very simple investigation. To some extent these were anticipated, and control samples provided for at most of the sampling stages. The difficulty of dealing, however, with such a multitude of samples as would be necessary to control all observation and observe every consignment at every step made it necessary to limit the number of samples collected. Dr. Orr, as a bacteriologist, seems to have enlarged the scope of the inquiry, and to have undertaken to some extent a classification of the bacterial flora found at various stages. Obviously this research greatly increased the value of the inquiry, for it introduced the consideration of whether any organisms different in kind from those received at the cowshed entered the milk on its way.

For the rest, the general directions of the committee, subject to any slight variations which might prove to be necessary as the inquiry went on, were—

To examine bacteriologically samples of milk from the same consignment at various stages of its journey, and, so far as possible, control samples, protected from outside contamination, but exposed to the same vicissitudes of temperature as those to which the milk in bulk was subjected.

To collect the samples at the farm and other places without warning, and to note at the time of collection the temperature of the air in the place of sampling, as well as of the milk from which the sample was taken. To note also the conditions obtaining

at the farm, the retail shop, the consumer's house; as to cleanliness, purity and temperature of the atmosphere. This included a general description of the cattle, as to housing and cleanliness, and of the condition of the farm otherwise. It was suggested that, in regard to country farms, the sampling should be done if possible by a town and country inspector acting in concert.

The work of bacterium counting, etc., to be done at the laboratory attached to the experimental farm at Garforth, where the Professor of Agriculture of the Leeds University promised active assistance.

It will be seen later that the conducting of the research work by Dr. Orr at the farm enabled him to make an experimental investigation as to the comparative bacterial content of milk from cows in various stages of cleanliness, which have a very considerable value.

The conditions of sampling, as afterwards modified, and the means taken to secure freedom from contamination in collecting, as well as the technique of culturing, will be found in Dr. Orr's portion of the report at pp. 8, 9 and 10.

II.

The findings of the Joint Committee.—While the report of their expert will be read with interest by all who have studied, or are studying, the important subject of milk contamination, the pronouncements on the part of a committee representing agricultural and urban authorities, trained agriculturalists and medical officers of health, will be regarded with a certain amount of confidence as the finding of a mixed body of business men and agricultural and sanitary experts. This confidence will be increased when it is known that the committee's report is signed by all its members without reservation.

Doubtless some points in their report would have received greater emphasis had the committee been a purely rural or a purely urban one—a purely sanitary or a purely agricultural commission. Perhaps, on account of its very moderation, the report is entitled to all the greater respect. The committee in arriving at their conclusions, naturally felt themselves limited to a consideration of the facts disclosed by the investigation itself,

and refrained from pronouncing, even on strong outside evidence, on questions on which their own inquiry has thrown no special light. These limitations, justified as they are by the conditions of their appointment, render it impossible to regard their findings as a full and complete solution of the whole subject of milk contamination. Limited to a single year, and that about the wettest and coolest on record, and limited, therefore, in some respects to a very small number of examinations, their inquiry stops short, naturally, at any appraisal of the exact amount of filth added to the milk uniformly at any particular stage of its journey. They do, however, unanimously find "that serious contamination does take place, and, to a great extent, of a preventable character"; and that, "in general, the greatest amount of contamination occurs at the cowshed." This last fact they attribute (a) to the dirty condition of the cows' udders, and (b) to the imperfect cleansing of the milk cans. They point out that contamination from the latter cause is greatest in summer.

They, referring to chapter and verse in the expert's report, state that this contamination at the cowshed can be almost entirely prevented by (a) washing of the udder and flanks of the cow and the hands of the milker; (b) sterilization of all vessels used; (c) rejection of the fore-milk; (d) avoidance of dust-raising work during milking; and (e) immediate removal of milk from the cowshed as soon as collected from the cow. They find that these precautions have an even greater importance in preventing contamination of the milk than even the purity of the atmosphere within and the cleanliness of the cowshed itself, important as these matters are from other points of view.

They lay stress upon the influence of temperature on the multiplication of bacteria introduced at the cowshed, and point out that such multiplication "is mainly a question of the temperature at which the milk is kept, and the time that elapses before consumption. The lower the temperature, and the shorter the interval of time the less do the bacteria multiply." They add that "the valuable effects of cooling cannot be fully attained unless the cooler itself during storage and use is effectively protected from contamination."

The committee then point out that, with the precautions they recommend in regard to sealed cans and coolness, no further contamination need occur in transit. They deprecate

the common practice of pouring milk from the farmers' to the retailers' cans in the dust-laden atmosphere of the railway station.

Additional contamination they say "arises from—

"(a) Exposure to dust—for example, in retail shop, during street delivery, or in the consumer's house;

"(b) Imperfectly cleansed milk receptacles, such as retailers' cans or consumers' vessels."

They then proceed, after directing attention to certain experiments detailed in Dr. Orr's report, to urge "that a very great improvement in the cleanliness of our milk supply might be effected if the attention and co-operation of the various persons concerned were secured in the following points." These it may be as well to quote in full. They are—

(a) *On the part of the Milk Producer.*—The absolute necessity of cleaning the udder and flanks of the cow, and of washing and sterilizing the receptacles in which milk is placed.

The desirability of rejecting the "fore-milk," and of removing the milk when drawn, as rapidly as possible, to a dust-free atmosphere.

The great improvement in keeping properties which may be effected by cooling the milk to 50° F. as soon as possible by means of a clean cooler, suitably protected from dust and other contamination.

The provision of cans with lids of such a type as to render contamination from without impossible. The cans in which milk is forwarded should be locked or sealed.

(b) *On the part of the Railway Company.*—The urgent necessity for rapid transit, especially during warm weather.

The provision of special vans, kept scrupulously clean and reserved for the milk traffic.

The necessity of maintaining the milk at a temperature not exceeding 50° F. during the time it remains in their charge.

The provision of a special shed in which milk should be placed immediately on its arrival at the station. This shed should be kept clean and cool, and used only for milk traffic.

(c) *On the part of the Retailer.*—The undesirability of transferring the milk from the farmer's can, as is usual at present, in the station precincts.

The prime importance of scrupulous cleanliness in all details of the handling of milk.

The desirability of thoroughly cleansing the farmer's cans before returning them. This implies the necessity, after washing out with clean cold water, of maintaining the can, etc., for some time at steam heat, in order to ensure thorough cleansing and sterilization, or, failing a supply of steam, of a thorough scalding with an abundance of boiling water.

The necessity of complete protection of all milk from dust prior to sale.

The importance of keeping the milk at a temperature not above 50° F.

(d) *On the part of the Consumer.*—The necessity for scrupulous cleansing and scalding with boiling water of vessels in which milk is placed. The further necessity of protecting the milk from dust during storage, of keeping it as cool as possible, and certainly at a temperature not exceeding 50° F.

Having dealt with these points thus in detail, the committee make an observation of such practical importance that, coming as it does from impartial investigators, it may be quoted in full:—

As a result of their investigation, the committee are of opinion that a much cleaner and more wholesome supply of milk can be obtained without a costly outlay in premises or special apparatus. It is, however, abundantly clear that, in dealing with an article that is so easily contaminated as milk, details which are very commonly regarded as trifling are really of the greatest importance, and it is evident that painstaking care at every point, with scrupulous cleanliness in person and habit, are absolutely essential. This involves intelligent supervision on the part of those owning or managing cowsheds, better arrangements on the part of the railway companies, and the exercise of care on the part of retailers and consumers.

The committee hope that, when it is realised how important a foodstuff milk is, and how liable it is to contamination, the common sense of all concerned in its handling may be relied upon to ensure their co-operation in the directions indicated.

To help in the attainment of this object the committee consider that a popular leaflet, based on the results of this investigation, would considerably help in the education of public opinion on the matter.

III.

The Report of the Expert.—Dr. Orr may be congratulated upon the opportunity afforded him for beginning so interesting an investigation. It has evidently been a labour of love. The mere requirements of his committee might have been satisfied with about half the work that his enthusiasm has led him to undertake. Yet none of the extra work he has brought to the task is valueless, though much of it must be regarded as preparatory to a longer inquiry.

Town and Country Milk.—The milks examined, except where experiments were undertaken at the farm, were all milks produced in or brought for sale into the five large county boroughs. He estimates roughly that some 58,000 gallons of milk are consumed in these towns daily, and that less than 24,000 of this is produced in the towns themselves. The

remaining 34,000 comes in, nine-seventeenths of it by road and eight-seventeenths by rail, the average distance travelled being about a dozen miles. Most of this milk was produced in Yorkshire, though about 8000 gallons came from Derbyshire (p. 7). Seventy-five sets of samples were collected, but in two cases some contamination occurred, and their bacteriological characteristics are not considered. In the remaining seventy-three, two or more samples were in every case taken at the cowshed, and one or more at other stages; not always the same stages in different milks. The samples obtained at these later stages were all collected in the towns named. The samples at the cowshed were taken in town or country, according to the situation of the shipen.

Of the seventy-three sets of cowshed samples bacteriologically examined, twenty-four came from town, forty-nine from country cowsheds. These numbers do not quite correspond to the proportions of town and country milks consumed in these boroughs—33 per cent. of the examinations were of town-produced milk, but the consumption of such milk was about 40 per cent. As the object was rather to find out where and to what extent contamination occurred, the committee seem to have wished for a larger number of samples of the longer-distance milks.

The cowshed milk was, in every case (except where used as a control) packed in ice when taken. Dr. Orr made a series of examinations of freshly-gathered milk, and of the same milk after it had been kept for various periods in ice and found that the variations between the fresh and the ice-preserved milks were not greater than might occur from experimental errors (p. 9).

He divided the cowshed milks into four classes, according to their bacterial content. Class A consisted of eight out of the seventy-three cowshed milks examined, and in which the bacterial colonies per cub. cent. at room temperature did not exceed 15,000. In this class, with the lowest bacterial content, six of the eight were town and two were country milks. But, as a percentage, 25 per cent. (six out of twenty-four) of the town milks came into this less-polluted class. Of the country milk, two out of forty-nine, or just over 4 per cent., came into class A. The actual numbers are, of course, too small for one to attach importance to the percentages.

Dr. Orr's Class B contained thirty-four

milks, twelve from town, twenty-two from country milk farms. In all these the bacterial content per cubic centimetre was more than 15,000 and less than 50,000. Twelve of the twenty-four town milks came into this class, or 50 per cent. Twenty-two of the forty-nine country milks came into Class B, or nearly 45 per cent.

Of all the milk taken in ice directly from the dairy of origin to the laboratory, therefore, 75 per cent. of those from town sheds and 49 per cent. of those from the country, were found to produce less than 50,000 colonies on gelatine at room temperature. "In three of the twenty-two country and one of the twelve town milks in Class B, the gelatine culture was spoiled and the figures are taken from the agar culture at blood heat. The agar count is usually less."

Clean and Dirty Milk.—Dr. Orr suggests that 50,000 bacteria per c.c. might, in the meantime, be looked upon as a sort of dividing line between moderately clean and very dirty milks. He made an endeavour, however, to estimate the contamination of milk, also according to the amount of sediment it contained. For this purpose he procured somewhat larger quantities of milk, allowed it to settle, and then centrifugalised the sediment by an arrangement he describes, and which was a modification of Houston's. He regards forty parts of washed sediment per million parts of milk as a convenient dividing line. Forty-three country milks examined direct from the cowshed had an average just under forty-one. Eighteen town milks similarly examined gave an average of twenty-eight. An interesting point about this part of the investigation is that the milk taken in these sixty-one consignments at the point of delivery contained much less sediment than that from the farmers' own cans at the starting point. A certain amount of the dirt taken in at the farm had probably settled in the farmers' cans, and not been transferred to those of the retailer.

Nature of the Sediment.—A good deal of information about this sediment will be found in the expert's report.

At page 50, he describes it as consisting of "vegetable particles from manure, granular dust particles, leucocytes and cellular debris, hairs, particles of straw, yeasts and bacteria. "The origin," he adds, "is chiefly the material adherent to the udder of the cow, and

especially the manure, which is shaken off into the milk during the process of milking."

As he regards the amount of sediment as "directly connected with the method of straining," he enters fully into the subject of the various modes of filtering and their relative efficiency. Table XII contains an account of the sixty-one milks already mentioned, and gives the amount as volumes per million, first of the cowshed milk, then of that of the same milk as retailed. The fourth column gives the inspector's report as to the cleanliness of the cows, the fifth the method of straining. The two following columns deal with the presence of streptococci where looked for, and the proportion of leucocytes in the farmer's and the retailer's sample. The three following columns deal with the cellular and granular debris and the source of the milk—town or country.

Bacillus enteritidis, Klein.—Section III of Dr. Orr's report sets out some of the work done in estimating the comparative numbers of these bacteria present in the same milks examined at different stages. The importance of this part of the investigation lies in the circumstance that, as an anaërobe, the bacillus does not multiply in warm milk, so that any increase in the numbers found at different stages would seem to predicate an addition from without after the milk left the cowshed. The method of ascertaining the comparative numbers present was less exact than the method of counting bacteria by the colonies produced on nutrient jelly. The method followed resembled in some of its details that usually employed in estimating roughly the numbers of colon bacilli. The samples were taken in certain known amounts, and the presence or absence of the organism tested in these different quantities. In a first series of estimates—consignments 7 to 46—the milk was used in quantities of 10 c.c., 1 c.c., and one-tenth of a cubic centimetre each, the smaller quantities being diluted by the addition of 10 c.c. of sterile litmus milk, the larger simply put into sterile tubes. They were heated for a quarter of an hour at 80° C (= 176° F.), put into Buchner's tubes with pyrogallate of potassium, and incubated for forty-eight hours. The tubes which gave the enteritidis change were counted as positive. Inoculations were not made. Out of the forty cowshed samples, seventeen (42.5 per cent.) gave the characteristic change in the quantities where 10 c.c. of the milk was used, but no

where the quantity employed was smaller. In twenty-five samples from milk kept in the house of the consumer, the presence or absence of this bacillus was recognised in each in the same quantity as in the corresponding cowshed sample. In six consumers' samples the organism was recognised in the 10 c.c. tubes, although not recognised in the tubes of the same quantity in the cowshed milk.

In another six samples similarly compared, the reverse was the case. The cowshed milk, in quantities of 10 c.c., had given the special reaction, but the consumers' samples of the same milk failed to do so.

As in no case had the presence of the bacillus been proved in quantities less than 10 c.c., it was resolved to deal with the remaining samples in larger quantities. Accordingly, in the second series of twenty-seven samples—Nos. 48 to 75, excluding 58—the quantities used were 20 c.c., 10 c.c., and 1 c.c. The cowshed milk gave positive results in twenty-three (or 85 per cent.) of the 20 c.c. quantities, and in the 10 c.c. quantities the positive result was secured in thirteen (or 48 per cent.). In none, where only 1 c.c. was used, was the positive result recognisable. In one out of the three milks where 20 c.c. gave no evidence in the cowshed sample, such evidence was obtainable in the same quantity in the consumers' sample. On the other hand, in eight consumer's samples, where the result had been positive in 20 c.c. of milk from the cowshed, the evidence was negative in that from the consumer's house. On the whole, the inquiry indicates that the presence of this bacterium was most frequently due to contamination at the farm, though in about 11 per cent. its presence would seem to point to after contamination. The significance of this bacillus is considered, and it is not perhaps necessary to remind the reader not to confuse this bacillus with Gärtner's *B. E. sporogenes*.

It should perhaps be added that, in Table XIII, Dr. Orr has set out the result in each series of his tests for this bacillus, not only in the cowshed sample, but in the control sample from the cowshed, and (where they were obtained) in the railway station sample, the retailer's sample, and the retailer's control sample, as well as in the sample kept at the consumer's house. A study of this table is interesting, revealing points where a general examination such as is given from a comparison only of the consumer's and cowshed

samples might mislead. For instance, in No. 74, the last milk but one examined in this way, the cowshed sample gave a positive result both in 20 c.c. and in 10 c.c. The control cowshed sample, which presumably had suffered from temperature as much and for as long a time as the consumer's sample, also showed the presence of the bacillus in the 20 c.c. and 10 c.c. specimens. The consumer's sample only reacted in the 20 c.c. specimen, while the action of the test gave no result in any of the quantities submitted to it from the retailer's milk or the retailer's control. In No. 73, both cowshed and cowshed control gave negative results, but the retailer's sample, the retailer's control, and the consumer's sample, all gave positive results in the larger quantity. In No. 72, all the samples examined—cowshed, cowshed control, retailer's, retailer's control and consumer's—gave a positive result in 20 c.c., but, rather curiously, the cowshed control, and only the cowshed control, gave a positive result in 10 c.c. Anomalies of this kind are noticeable in several other cases, and, as already said, warrant a careful study of the table itself. Dr. Orr found no definite relationship between the presence of this bacillus and a large general bacterial content.

Glucose ferments.—In section IV. Dr. Orr deals with the organisms in each batch of specimens producing acid and gas in McConkey broth. The quantities of milk added to the broth varied from 1 c.c. to the millionth part of a cubic centimetre. The inoculated tubes were incubated at 37° C. for at least forty-eight hours, those showing the presence of gas after that time were plated out for purposes of further identification. The general result was to show that coliforms were found in higher and higher dilutions as the milk travelled. Dr. Orr, however, regarded the method as too rough to show how much of the increase was due to simple multiplication, and how much, if any, to additions on the way. Table XIV sets out the smallest quantity in which this coliform reaction was manifested in the cowshed sample and the cowshed control, in the railway station sample, the street sample, the sample taken on the retailer's own premises, and the control sample so taken and in the sample taken after being kept at the customers' house. This table also will repay study, but it is impossible even to refer to all the interesting problems opened out by this research. Fortunately Dr. Orr has put most of his findings into figures.

In this connection, however, one must refer to the search for gas formers in fresh and dry cowshed manure, and in the washings from milk churns already prepared *more bucolico* for the reception of fresh milk. This last test is so important that at the risk of being wearisome it must be referred to. Four milk churns, which were ready to receive the new milk, were washed out, each with 100 c.c. of sterile water, and dilutions of this fluid inoculated into glucose broth. In No. 1, the dilution of 1 in 1,000 gave the reaction; in No. 2, of 1 in 10,000; in No. 4 of 1 in a million; and in No. 5, of 1 in 100,000. Such a result must give us pause. The report is, however, full of wayside experiments of this sort, showing with what enthusiasm the bacteriologist set about his work.

Streptococci.—The milk of nine cows, drawn direct from the udder into sterile flasks, was examined for streptococci. Quantities of 10 c.c. and 1 c.c. of the fore, the middle, and the last-drawn milk, were examined for these chains. The 1 c.c. in no case gave a definite result, but in quantities of 10 c.c. positive results were given in six of the nine cows in the foremilk, in five of the nine in the mid-milk, and in three of the nine in the strippings. The milk, in each case, had been drawn from the right fore-quarter of the animal. In seven of the nine cows the same experiment was made with the milk from the other three teats. Teat B gave a positive result in four of the seven cows with 10 c.c., and in one of them also with 1 c.c. Teat C gave only one positive result in the 10 c.c. quantity, while teat D, in one case, also gave the positive result, but with both the ten and the single cubic centimetre.

The highest dilutions showing presence of streptococci are given on p. 67, and show an increase of the organism as the milk travelled. As in the coliforms, the method is too rough to show what amount of fresh contamination occurred at such stage; the results, are, however, set out in detail in Table XV, which, like its predecessor, gives the dilution responsive in the sample from the cowshed and its control, the station, the street, the shop and its control, and the household keeping cellar. Various side issues are discovered and results of experiments, such as with "clean" milk cans given. The dairyman's "clean" cans seem to have been somewhat freer from streptococci than those of the farmer. It may be mentioned here in passing that the farmer's

cans, when washed by the milk vendor, were generally freer from bacterial life than when washed by himself.

Distinctions between Bacteria found.—A valuable table (XVI) gives the special organisms identified, and the results, as + or —, of the growth of the glucose ferments on glucose, lactose, saccharose, ducite and adonite, as well as the appearances in a gelatine stab, on an agar slope, the development of indol, the response to the Voges and Proskauer reaction, and the presence or absence of motility. Table XVII gives for each of the bacilli so isolated a statement in which milks and at what stages it was found, and which of the reactions named were present in each case. The same information as to manure, dry and moist, and as to the plates exposed under cows during milking, is added to this table; while in Table XVIII we are presented with the numbers of certain of these plated-out organisms found in samples at different stages. The work represented by these three tables deserves more notice than can be given it at the end of a somewhat lengthy review.

Suggestions and Conclusion.—It is interesting to compare the conclusions of the report with the pronouncement of the joint committee, and note which of the former have been regarded as not yet proven. The final tables show nearly every analysis made, and give a faint idea of the work involved in the inquiry.

The important question as it seems to us is, "Who is to continue this inquiry?" Valuable as has been the work done at the instance of these Yorkshire authorities, it almost seems as if they had stopped just as the inquiry was getting most valuable. What modification of the results would have taken place had the summer of 1907 been a hot and dry, instead of a cool and wet, one? What modification of Dr. Orr's interesting estimate of the proportionate guilt of causing contamination (which the committee have not adopted in full) would have occurred if the method of obtaining a control of the milk in the keeping cellar had been adopted earlier, and especially if it had been extended over a considerable period of warm weather?

These are interesting questions one would like to see answered. "Who will bell the cat?" Nothing has been said about the pictures. One generally looks at them first. We hope the farmers who get held of this brochure will do so and feel a holy awe.

TREATMENT OF DIPHTHERIA.

By C. J. RUSSELL McLEAN, M.D., EDIN., D.P.H.,
Medical Officer of Health, Doncaster Rural and Tickhill
Urban Councils.

I DO not intend in this paper discussing the various methods of the treatment of diphtheria, but simply to describe those which I have found most satisfactory, both in hospital and private practice.

Treatment may be considered under the three following heads given in the order of their importance:—I. Specific, II. General, III. Local.

I. SPECIFIC TREATMENT.—By this I mean treatment by diphtheria antitoxin. To get the best or specific result, the serum must be given in the earliest stage of the disease, if possible within twenty-four hours of the onset. Satisfactory results depend absolutely on this.

In every case where diphtheria is diagnosed clinically, or even suspected, antitoxin should be given at once and freely. If acquainted with the simple technique, a bacteriological examination of a throat specimen may be preferably made, prior to giving antitoxin, but no delay should ever be permitted in waiting for the report of a specimen sent to laboratory. Administer the serum at once. If, later on, a *negative* report is received, which does not always disprove diphtheria, no harm will have been done, whilst if it is positive, one has the comfortable feeling of having got in the "first blow" in the fight, as, according to Dönitz, the remedy is only useful in neutralizing the toxin, which is extra cellular and free in the circulation, and has little effect on that which is fixed in the body cells, and which has already done the damage. Hence, therefore, the benefit of early administration, as the multiplication of the bacilli and consequent manufacture of toxin is the more readily arrested.

Dosage:

In cases seen on the first day of the disease,	2,000 units.
" " second " " "	4,000 "
" " third " " "	6,000 "
" " fourth " " "	8,000 "
" " fifth " " "	10,000 "

In severe cases, laryngeal, or nasal cases, or those with a very rapid pulse, of 140 or over, temperature not over 100°, and a large amount of false membrane, the dose of serum should be 8,000 or 10,000 units, irrespective of the day of disease.

If an irregular toxæmia exists, as is common in nasal cases, it may be advisable to give one dose of 20 to 30 c.c. of Polyvalent anti-streptococcus serum at the same time, though I have not a great deal of faith as regards its effect in such cases.

If the pulse-rate falls, the false membrane begins to separate, or shows no extension, and general symptoms abate within twelve to eighteen hours—as is usual in cases of average severity treated with serum during the first or second day of the disease—no further dosage is necessary.

If the pulse-rate does not fall, or rises, if exudation increases and general symptoms are not improved in twelve to eighteen hours, a further dose of antitoxin should be given of half the initial quantity.

If the case continues to pursue an unfavourable course, further dosage may be tried, but my experience is that the remedy, as such, becomes of less value after the first, and almost useless after the second injection. Yet it should be tried.

Cases treated for the first time on the fourth day of the disease, stand a much diminished chance of improvement with serum, whilst those treated on the fifth day are practically uninfluenced by it.

Small repeated doses of 300 to 500, or even 1,000 units, is a useless procedure, and trifling with the disease. Heroic doses of 20,000 to 50,000 units are, I am certain, unnecessary, and no more beneficial than the doses above mentioned. Such large quantities, in fact, may be actually harmful by throwing too great a strain on the already overtaxed excretory organs. I do not think the maximum dose should ever exceed 10,000 units, and I have not seen any specially good results from intravenous injection, though theoretically it might be expected, especially in severe cases only seen some days after the onset. Statistics in New York show, with small doses of antitoxin, a mortality of 21 per cent. with larger doses of 5,000 to 10,000 units one of 14 per cent.

Children should not have smaller doses of antitoxin than adults, but, on the contrary, usually require larger amounts, owing to their natural powers of resistance to the toxin being less than in older persons. The condition of the patient, together with the location and duration of the disease, should be the deciding factors as regards the dosage rather than the age of the patient.

Administration.—The serum may be injected under the skin between the shoulders, in the loose tissue, internal to the inner edge of the scapula, but I prefer either a spot some two or three inches below and to the left of the umbilicus, or one about two inches below it, either of those being easy to get at, and less likely to cause discomfort than in any other part. The skin should be well washed and covered with wet boracic lint for half an hour or so prior to injecting, and the point of puncture immediately covered with a little wool and collodion. The needle should be plunged well under the skin to begin with, and gradually withdrawn as the liquid is slowly injected. It is scarcely worth while freezing the skin. The resistance to the entrance of the needle is thereby increased, and as finer needles can be quite well used, if the liquid is slowly injected, than those at first employed, the pain is very slight. If a large dose of serum is to be given, it is advisable to give it in two injections at different parts of the body.

The syringe and needle should be boiled immediately before use, making sure, also, that the needle is clear and the syringe in good working order. It is advisable to again boil the needle and syringe immediately after use. A blunt-ended needle should be used to fill the syringe, as by drawing up the serum with the sharp needle the fine point is soon destroyed by coming in contact with the bottom or sides of the vial. The vial of serum (which must be quite clear) should not be opened until quite ready to use it, and any serum remaining should be destroyed. The vial should not be re-sealed in order to keep it for another case. Having myself suffered from the use of a dirty needle in the earliest days of the treatment, I would the more urgently press for strict measures of cleanliness in carrying out the process.

Tracheotomy.—Since the introduction of antitoxin, laryngeal cases have lost much of their terrors, both as regards the mortality without operation and in those requiring tracheotomy. My limited experience of tracheotomy without antitoxin was, I am afraid, a very unsatisfactory one, but with it, the operation, unless in hopelessly delayed cases, is likely to be successful. Laryngeal cases now, as a rule, do well if treated early enough and with sufficient dosage of serum, and only seldom require operation. A word of warning is, however, necessary as regards cases in

young children with a large amount of exudation in the lower part of the larynx, and which are doing well with antitoxin. In these, the separation of the false membrane is usually more rapid than is the case in the faucial affection, the ciliated epithelial lining of the larynx permitting of separation of the membrane more readily and in larger pieces or casts than in the case of the fauces, where the epithelium is of the squamous, or flat, variety. If, therefore, the patient has difficulty in expelling the membrane by coughing, there may be a sudden onset of suffocation, necessitating immediate operation, just when the case was apparently progressing most favourably. Such cases may be actually put down as ones of sudden heart failure. It is wise, therefore, in laryngeal diphtheria to warn the nurse in charge and to have the necessary apparatus for operation ready. So far as my limited experience goes, I much prefer tracheotomy to intubation.

Complications.—Rashes of an erythematous or urticarial nature, lasting twenty-four to forty-eight hours, sometimes occur a few days after the administration of antitoxin, and are usually accompanied by intense itching, especially of the feet, and occasionally, though less frequently, followed by a form of arthritis. This is not usually severe nor very lasting, though a case has come under my observation where joint pains have been more or less constantly present for a period of over six years since the patient received antitoxin. Albuminuria occurs in a good many cases of diphtheria, but rarely passes to a definite nephritis. The administration of antitoxin, in my opinion, somewhat increases the liability to this complication, but cases, as a rule, do well. As purer sera are obtained, these complications may become less frequent, though their absolute disappearance is unlikely, owing, it is said, to a natural peculiarity in horses' blood serum, and quite apart from antitoxin.

Paralysis is by some considered to be more prevalent after the use of antitoxin than formerly. I am not of this opinion. As the natural result of a reduced mortality from the disease due to antitoxin treatment, there are, of necessity, more cases which may subsequently develop this complication. So far as I have seen, the cases are not of a worse type than in pre-antitoxin days.

Mortality.—If the serum treatment is begun during the first twenty-four hours of the

disease, the mortality will not exceed 1 to 2 per cent., or probably less. If begun within forty-eight hours of the onset, it should not be over 3 to 4 per cent. At the Metropolitan Asylums Board hospitals, where large numbers of cases in all stages and conditions are treated, the mortality has fallen from over 37 to just over 15 per cent. since the serum treatment was adopted. The general mortality at present is probably under 10 per cent.

Prophylaxis.—Individuals who are, or have recently been, in contact with a case of diphtheria, especially if of a severe type, should at once be given a protective dose of 500 units of antitoxin, thereby anticipating, if not actually preventing, an attack of the disease. Such protection only lasts about four weeks, and as the infection of a case frequently persists longer than this period, it is advisable to repeat the dose not later than a month if the person is still in contact with the disease, or if the throat be not well by that time. As an example of this condition, I may mention the case of a nurse in a diphtheria ward, who, unless she received a dose of serum every three or four weeks, was laid up with a mild attack of diphtheria. Susceptible contacts, and there are many such, should be so treated and strictly isolated under medical observation for some days. Convalescents and "carriers," who, though apparently quite well and have no local lesion, yet have the *Bacillus diphtheriae* present in the throat or nose, should be kept isolated until three swab examinations are "negative."

II. GENERAL TREATMENT.—This is important, and may be considered under three headings, viz: 1. Food; 2. Rest; 3. Medicinal.

1. **Food.**—The diet must be of a nutritious, light and varied nature. Food should be given every two to two-and-a-half hours. In no case must the stomach be overloaded, nor should any article of food be enforced which is repugnant to the taste. Milk, as a rule, is acceptable, and may be given either raw, boiled or thickened with a cereal food as preferred. Curds and whey, made with unflavoured rennet and sweetened, is a nutritious food, and usually well taken by children. Eggs, as thin custard, or white of egg beaten, sweetened and a little water added, or milk if it agrees. These, with Liebig's extract, or broths and thin bread and butter, with plenty of weak tea, should form the basis of feeding during the acute stage of the disease, and may be supplemented with jellies, wheat-crystals (an excellent preparation), etc. Plasmon and Sanatogen are valuable additions, and refrigerants in the

way of grapes and oranges are comforting, and should be allowed. Sweetened drinks should be avoided, but weak tea and frequent sips of cold water are refreshing and useful, as is a little pure lemon juice for those who like it, but not taken with or immediately after milk. As convalescence becomes established more solid food may be allowed, such as minced chicken, sweetbread, fish, etc., and so on gradually to ordinary diet, including red meat. In some cases where vomiting occurs, rectal feeding is necessary.

It is important for the welfare of the patient that abundance of fresh air be admitted to the room, taking care, of course, that no actual risk be run of giving the patient a chill, as such cases are very liable to develop pneumonia.

2. **Rest.**—Every case of diphtheria in children must be kept in bed without pillows for at least two weeks, the only exception to this being in a few cases, where, from extreme laryngeal obstruction, there may be difficulty in breathing. If much objection is offered to the flat position, one pillow may have to be allowed, but in such cases the feet of the bed should be raised on blocks. In most cases there is no objection, and, if all goes well, one pillow may be allowed in the third week and two in the fourth, at the end of which period a back rest may be permitted for another week before leaving bed, making in all five weeks confinement to bed in uncomplicated cases. This may seem a long period, but, in my opinion, is not too long, and might with advantage be more generally carried out in the case of children in private practice. In adults the position need not always be quite flat nor so long continued. The main points to observe are to see that only gradual resumption of the erect posture is permitted, and to observe its effect on the heart daily.

If there is evidence of any heart complication, the flat position in bed may be necessary for a further two to four weeks, and in any case medical supervision should be kept up for six weeks from the onset, both for the sake of the patient and for the safety of others, as in probably five or six per cent. of cases infection may be retained for that period.

Heart Complication. The condition of the heart should be carefully watched in diphtheria from the onset, but especially towards the end of the first week, when a possible vagus neuritis may become manifest; and again from the end of the second week onwards, when actual muscle degeneration of the organ, due to toxæmia is likely to occur. It is in these cases that sudden exertion sometimes proves serious or fatal.

An important sign to observe is vomiting,

which is frequently a warning of heart complication, a condition which is explained when we remember the intimate connection between the nerve supply of the heart and the stomach by the motor fibres of the vagus nerve. Accompanying signs of cardiac complication are, an irregular or galloping "tic tac" rhythm of the heart, a murmur, usually systolic, reduplicated sounds, a low tension pulse, accompanied by a restless sighing condition of the patient, cold limbs, increasing prostration, pallor and dyspnoea. Such cases are very often fatal, despite all treatment, which usually resolves itself into the giving of strychnine hypodermically, and keeping up the action by further injections, and giving by the mouth, in combination with strophanthus, also oxygen inhalation, hot saline solution per rectum, and rectal feeding, with warm applications to the limb.

3. *Medicinal*.—Little or no medicine is required in an ordinary case of diphtheria, though in the early stages some citrate of potash or ammonia may be of some service in helping the elimination of waste products. Plenty of water to drink may, however, be quite as useful at this period. I do not recommend the giving of iron owing to the discomfort in the mouth and the anorexia which it induces. It has no influence on the disease in the acute stage, but during convalescence, in combination with arsenic and strychnia, it is of service. Stimulants are beneficial in many asthenic cases, in the form of champagne or good brandy, in the early stages, and old port wine, with or without bark, during convalescence. On the first sign of cardiac complication, small doses of strychnia and strophanthus should be given.

III. *LOCAL TREATMENT*.—If a sufficient dose of antitoxin has been given in the early stage of the disease, very little local treatment is required, beyond frequent flushing of the mouth and throat with a simple warm alkaline douche or spray, the best of which I think are either a solution of borax and bicarbonate of soda in water and glycerine, or glycothymoline, to which a little more soda has been added. Either of these may be applied to the nostrils if desired. A weak spray of permanganate of potash may be used for the throat, and for adults listerine makes an excellent mouth wash and gargle. Alkaline solutions keep the mouth moist and comfortable and help to loosen the membrane. Strong or caustic applications should be avoided. I have never found any of them tend to arrest the disease, and they always cause discomfort or pain, and are dreaded by children. In the later stages of the disease, the ordinary astringent paints and gargles may be used with advantage.

THE CONTROL OF RINGWORM IN SCHOOL CHILDREN.

By H. MEREDITH RICHARDS, M.D.

Medical Officer of Health, Croydon.

(From the Annual Report on the Health of Croydon, 1907).

THE following table shows the number of cases of ringworm supervised by the Public Health Department during 1907:—

Total number outstanding				
January 7th., 1907	Scalp	41		
	Body	21	63	
Total number reported during 1907	Scalp	310		
	Body	176	486	549
Total number freed during 1907	Scalp	245		
	Body	177	422	422
Total number outstanding				
January 6th., 1908	Scalp	106		
	Body	21	127	127

It will be noted that the number of cases outstanding at the end of 1907 was in excess of the cases under treatment at the beginning of the year. This was to be expected, as one of the first results of municipal treatment was to increase the number of cases reported from the schools. It is very probable that there may be a further increase during the current year as a result of the recently-adopted scheme for the medical supervision of all school children.

I have received so many inquiries from other districts and from medical practitioners in the town as to the exact procedure adopted in Croydon, that at the risk of repetition I have incorporated the following summary of the work in this report:—

(1) Children suffering from ringworm are reported to the medical officer by the teachers and attendance officers.

(2) These and any other cases coming to the knowledge of the medical officer are excluded from school until released by him.

(3) The notification is sent to the health visitor for the district, who visits the home and informs the parents that the child must either be treated by their own doctor or be brought to the town hall at certain fixed times, where free treatment can be obtained. At the same time, the health visitor obtains specimens of the diseased hair in order that the diagnosis may be verified at the laboratory if necessary.

(4) Parents who elect private treatment are thereupon notified to the attendance officers,

who keep the children under observation until they are said to be free from infection. When this point is reached a medical certificate must be sent to the medical officer, or the child brought to the town hall for inspection. In either case the child is freed from quarantine and allowed to resume school. It is, however, wise, subsequently, to examine these children in school as relapses sometimes occur, and there is some haziness as to what constitutes freedom from infection. Here the assistance of the laboratory is invaluable.

My own practice is to regard a case of ringworm treated by drugs as infectious until the diseased patch is covered with hair of normal texture and "set," and until the scalp is free from scales and no diseased stumps can be detected after careful examination with a hand lens.

Children treated by X-rays are regarded as free from infection and allowed to return to school as soon as the affected area is absolutely bald and the last diseased stump has been extracted. This is often a somewhat tedious process as the hairs have a way of breaking off close to the surface of the scalp. Children sent back to school at this early stage should invariably be kept under supervision in order to guard against the danger of relapse.

(5) Should the parents select municipal treatment, the child attends at the town hall, where either drugs or X-ray treatment is prescribed. In either case it is kept under observation by the health visitor for the district and not allowed to return to school until medically examined.

Treatment.—This is not the place to discuss therapeutics and the account need only be brief. In the selection of drugs safety as well as efficiency must be respected. Ringworm of the body is, of course, always treated by drugs. A cure can easily be effected within seven days if the parents will take the requisite pains and carry out instructions. The children are frequently in school again at the end of a week or ten days. The average time is, however, from various causes, about two-and-a-half weeks. For ringworm of the scalp, the choice between X-rays and drugs is guided by the following considerations:—

Indications for X-ray Treatment.—(1) Chronic places with more than one patch.

(2) Children whose parents are too busy or too neglectful to carry out drug treatment efficiently.

(3) Children in the higher standards whose time is valuable, and who are working for scholarship examinations. Older children are often slow in responding to drug treatment, and therefore the X-rays offer the more rapid cure.

Indications for Drug Treatment.—(1) All recent cases.—About two-thirds of all recent cases can be successfully cured by drug treatment within three months, often in much less than this. Even though about one-third of the cases are stubborn and slow in responding, it is well to begin by drugs, as their use will usually check further spread, except in very virulent cases, and therefore the area for the application of X-rays can be more accurately defined. The primary application of X-rays to recent and rapidly-spreading cases (as was attempted at first) frequently led to the necessity of a second application of the rays, owing to the appearance of fresh patches, and consequently to considerable loss of time.

(2) Children under five years of age.—Young children usually respond readily to drugs unless they have been long neglected. Also it is difficult for little children to sit still long enough for the application of X-rays.

(3) Where the parents object to X-rays.—The success of the drug method very largely depends on the energy with which the treatment is pursued. The patients should be seen frequently by the doctor, and the parents require constant keeping up to the mark. For this reason a very great deal of supervision is necessary if the treatment is to be rapidly successful. Really energetic parents can often get their children well in a month or six weeks.

A small proportion of children appear to relapse. This is particularly so in old-standing cases which have apparently yielded to treatment. For this reason it is desirable to keep them under observation for three months after the cure is apparently complete.

We cannot enter into the matter in further detail, but it is important to indicate the probable time required for scalp cases.

During the last twelve months the average time taken in X-ray cases from the first exposure to the complete cure has been eight weeks, the shortest time being three weeks and the longest thirteen weeks. The time varies according to the number of exposures necessary. In addition to the time taken by

The teacher remonstrated with her concerning this carelessness and slovenliness, and

some apparent improvement had resulted at the dictation lesson on November 4th.

Dictation - 4.11.07
It may be well to point out the changes that most

On November 13th the writing was still bad.

much and grows rapidly. The second stage is a curious

At the transcription lesson of the same date it was almost illegible at the beginning.

Transcription
I should like just the chance to show

The teacher remonstrated during this lesson, with the curious result given below. One line, it will be observed, is written in a very fairly clear hand, the next is irregular, and the last has reverted towards illegibility. This was

caused by the rapidly increasing loss of control as the child grew tired from the great effort involved in attempting to steady her jerky muscles.

Who has slept undisturbed
in his casket
He is little two-thirds of
a year
I should like just the
chance to show you

MEDICAL INSPECTION IN PUBLIC SCHOOLS.*

By THOMAS F. HARRINGTON, M.D.
Director of the Department of School Hygiene,
Boston, Mass., U.S.A.

DR. HARRINGTON has recently published a highly interesting and suggestive pamphlet with the above title, in which he traces the development of school hygiene in the United States, and describes in detail the organization of the Department of School Hygiene in Boston. We give the following extracts from Dr. Harrington's pamphlet.

"The idea that medical science had any relationship to the problems of public school life was not entertained prior to the great awakening in preventive medicine during the epoch 1880-90. During this remarkable period, Robert Koch discovered the bacillus of tuberculosis; Eberth, the organism of typhoid fever; Klebs and Loeffler, the bacillus of diphtheria; Lavan, that malaria was transmitted by mosquitoes; Fehleisen, the streptococcus of erysipelas; Kitasato, the bacillus of tetanus—discoveries that transferred tuberculosis from the class of diseases supposed to be inherited, and placed it in the category of diseases preventable and curable; that proved diphtheria to be a specific, communicable disease, and not a filth disease; that suggested that skin affections may be contagious, that lockjaw may be epidemic; and that night air is as healthful and as free from disease as day air.

In such a renaissance it was but natural that attention should centre upon those affections which for ages had been known to be communicable and most prevalent at the earlier periods of childhood. The legal authority to carry out such an investigation was the Board of Health; the most likely place to find the facts was in the aggregation of children in school. Thus originated the first scientific basis for medical inspection of schools. This was at Boston, Massachusetts, in 1892.

The relationship of public-school life to medical science since this introduction of medical inspection is one of interesting evolution. First came the movement to prevent the schools from becoming centres of infectious or contagious diseases; then followed the attention to such hygienic

The teacher then decided to recommend her for examination by Dr. Clarke, the school visiting medical officer, in order to ascertain whether or not this remarkable "carelessness" was the fault of the pupil. This was done on the same day. Examination showed that she was suffering from severe St. Vitus' Dance. She was promptly sent home, with a note advising her parents to have her treated. The advice was taken, and she is now stated to be improving rapidly.

St. Vitus' Dance usually begins with slight twitchings of the face or jerky movements of a hand. The child "fidgets," and deliberate movements become clumsy and jerky. Objects are picked up with difficulty, and with some preliminary irregular or hasty movements of the hand. The child often drops things or knocks them over. These twitchings and fidgetings increase, especially under any strain (such as that caused by reproof or punishment), until severe contortions affect almost every voluntary muscle of the body. The contortions nearly always cease during sleep, and at first they may often be controlled to some extent by a strong effort, as in the case described above. Speech is often affected, and in some cases word-memory suffers. The child often becomes emotional, and bursts out crying if corrected for fidgeting or clumsiness.

The average duration is about two months, but if not attended to the disease may go on for one or two years. Relapses are common. It is a serious disease from the educational standpoint. The sufferer requires very careful and kindly handling at school. Heart disease is a fairly frequent sequel of chorea.

Exclusion is not, as a rule, necessary, except in such an advanced and serious case as the present one ultimately became. Light school work is often an aid to recovery, but errors due to the disease should be very leniently dealt with. It is sometimes necessary to make sure that the sufferer is not worried by other children out of school.

A child who develops "fidgets," together with a tendency to deterioration of handwriting, should always receive careful attention on this account. Twitchings of the hands or face should be watched for. If these are noticed, the child should (if in a city school) be at once reported for examination by the visiting medical inspector, or (if in a country school) the parents should be advised to secure medical advice.

The present case illustrates well the necessity for close attention to the physical side of child life as an essential feature of skilful and effective teaching. Children do not suddenly become "stupid," or "dull" or "slovenly" in their work without some good physical cause to explain it. It also illustrates the value of skilled medical advice as an adjunct to school work.

problems as schoolroom environment, proper seating of the children, the lighting, heating, and ventilation of school buildings; next came the examination of each school child in order to ascertain his physical asset for the life mapped out for him and the removal of remediable causes of handicap or a modification in the school programme and extra school life of the child in order to avoid possible shipwreck. This was followed by the scientific study of the development of great groups of children in order to obtain accurate data of their physical and mental growth, so that the factors of heredity, age, sex, race, environment, and nutrition might be properly estimated in their bearing on pedagogical progression and racial deterioration. The later stage in this evolutionary process has to do with all those measures tending to the promotion of the physical health and the corresponding growth of the individual child, and is embraced in the term "school hygiene."

* * *

The Department of School Hygiene established at Boston, Massachusetts, the first in this country, if not in the world, has the following organization. The organization provides for a director of school hygiene, three assistant directors, as many special instructors in physical training, special assistant instructors in physical training, instructors of athletics, and assistant instructors of athletics, supervisors of playgrounds, playground teachers, heads of playgrounds, helpers in playgrounds, and helpers in sand gardens, as the Board may from time to time authorize; a supervising nurse and assistant nurses; an instructor of military drill; and a medical inspector of special classes. The director of school hygiene shall have general supervision and control of all matters affecting the physical welfare of pupils and teachers; of medical inspection, except that under the control of the Board of Health; of school nursing; of physical training, military drill, athletics, sports, games, and play engaged in by pupils or conducted in buildings, yards and grounds under the control of the Board, or in other buildings, yards, and grounds that it may have the right to use for such purposes. In the normal school, the health of the pupil-teachers is under personal supervision of the director, who is a physician. Here, as well as in the high schools, a gymnasium is equipped and special teachers are provided for instruction and the physical examination of the girls.

Military drill is provided for the boys. Both courses are compulsory. All high-school pupils, boys and girls, are compelled to take a setting-up drill of ten minutes' duration each day. This is given by room captains selected for the purpose. In the elementary schools and in the primary schools, calisthenics and drills in the class-room and corridors are given by the teacher under supervision of the assistant director.

From the kindergarten to the normal school one principle is emphasized, namely, that proper breathing, proper standing, and proper carriage are the three essentials of all physical training. These essentials are taught and enforced in the schoolrooms in every movement of the child, and not left to gymnasium or calisthenic periods or military drill periods alone. Instructors in athletics have a rating and a certification similar to regular teachers, and after written and practical examination. Selected teachers in the elementary schools act as play-teachers for the children of these schools after hours daily, and on Saturdays and holidays, extra compensation being allowed for this work.

School yards in crowded districts are being equipped with suitable apparatus for playgrounds for younger children. The season is to run from May 1st to November 25th; matrons, janitors, and teachers are furnished by this department. On large playgrounds belonging to the Park Department, as well as at the public baths, arrangements are made whereby instruction in athletics, swimming, games, and play may be carried on under school supervision, thus offering the best means to make these activities a source of better health to all the children rather than a spectacular exhibition by the few. A specific appropriation, amounting to more than \$50,000 annually, is provided for these purposes by legislative act. This appropriation cannot be used for any other purpose.

The nursing division of the department is under the direction of one supervising nurse, who has, at present, thirty-four assistants. The division is provided for by an additional special appropriation of \$25,000 annually. Rooms are equipped at schools in each district, and each nurse has an assignment of approximately 2,700 pupils. These nurses are appointed from a certified list similar to that of other employees in the service. The following report of the first twenty nurses appointed under this department for the

period September 11th, 1907, to February 1st, 1908, shows the work possible under this adjunct to health and efficiency:

Diseases of: Ear, 1,492 cases cared for; Eye, 6,078 cases cared for, including 3,649 suffering from defective vision; of these 1,131 were corrected by oculists; Nose, 2,602 cases, of which 1,405 had adenoids, 423 of whom had the obstruction removed; Mouth, 1,765 cases, including 1,686 who had carious teeth; Throat, 1,695 cases, including 683 of hypertrophied tonsils, and 608 of tonsillitis; Skin, 10,139 cases, all of which were followed to their homes and the parent or guardian instructed how to care for the same.

In addition to the above, 2,563 pupils having abrasions and wounds, received 9,144 dressings; 2,034 miscellaneous affections, including 350 septic wounds, 312 suffering from renal disease, 121 having rachitis, 207 suffering from malnutrition, 227 with epilepsy, 126 with chorea, and 548 with bronchitis, anæmia, and heart disease were treated; 3,120 excluded pupils were followed to their homes; 3,293 were taken to family physicians, resulting in 3,202 being cured and returned to school at the minimum of absenteeism; 4,772 were taken to hospitals on request of parents; and 3,223 of these were cured and returned to school; 7,559 home visits were made for the purpose of instructing or advising parents concerning the children, or in order to persuade the parents to seek proper medical or surgical aid for the child. There were also 2,882 affections looked after, of which there is no classification. These do not include the specific infectious diseases.

The nurses are not permitted to visit homes of contagious diseases. The great advantage of having a nurse under the school jurisdiction who may look after the minor ailments in school life and who visits the homes of children, giving advice and assistance to mothers, and in harmonizing the fixed customs and traditions of a great alien population with our habits and standards of living, is solving many vexatious problems of the past, and forms a link between the school and the home not possible by any other means. It does not seem possible to conceive a more satisfactory arrangement, nor a more effective piece of school machinery than nurses under school supervision. With a corps of medical inspectors under this same supervision, who would conduct a daily clinic in their respective school districts, there are no problems connected with the health and efficiency of school children which could not be quietly, rationally, econo-

mically, and effectually solved. Until such an organization is perfected in part or in whole, little progress can result from the efforts to promote the health and efficiency of our school children.

I append the result of medical inspection under the Board of Health at Boston, and the number of cases reported from the schools since the introduction of school nurses under school supervision:

Year.	Diphtheria.	Scarlet Fever.	Measles.
1895	77	28	116
1896	26	8	59
1897	30	31	100
1898	8	16	26
1899	13	5	85
1900	23	23	121
1901	9	9	25
1902	7	2	69
1903	32	29	121
1904	11	10	264
1905	1	9	16
1906	13	13	70
1907 (Sept. 11 to Feb. 1, 1908) ...	392	407	167

DUTIES OF OFFICIALS.

Assistant directors of school hygiene, special instructors in physical training, special assistant instructors in physical training, instructors in athletics, assistant instructors in athletics, supervisors of playgrounds, playground teachers, helpers in playgrounds, and helpers in sand gardens, shall perform such duties as may be assigned to them by the director of school hygiene.

The assistant directors of school hygiene shall be entitled to four weeks' vacation in each calendar year, to be taken at such time or times as the director of school hygiene may appoint.

The supervising nurse shall, under the direction of the director of school hygiene, have general supervision of the assistant nurses, be responsible for the efficiency and character of the service rendered by each nurse, and perform such additional duties as the director of school hygiene may appoint.

She shall determine, subject to the approval of the director of school hygiene, the hours of service to be rendered on school days, and on Saturdays, and during vacation, by the assistant nurses.

She shall inspect the work of the assistant nurses, instruct them in their duties, and see that the time spent in each district by the nurse assigned thereto is regularly recorded.

She shall make requisition for the necessary supplies for each nurse.

She shall make such reports as may be required by the superintendent.

She shall be entitled to four weeks' vacation during each calendar year, to be taken at such time or times as the director of school hygiene may appoint.

The instructor of military drill shall, under the

direction of the director of school hygiene, have charge of instruction in military drill. He shall make such reports as may be required by the superintendent.

The armourer shall, under the direction of the instructor in military drill, have general charge of the military equipment provided for the schools.

The medical inspector of special classes shall perform such duties in connection therewith as may be assigned to him by the director of school hygiene. He shall make such reports as the superintendent may require.

1. It shall be the special duty of the assistant nurses to assist the medical inspectors assigned to the public schools, to see that the directions given by the inspectors are carried out, and to give such instruction to the pupils as will promote their physical welfare.

2. They shall receive from the supervising nurse the following information: (a) The schools in which they are to perform their duty. (b) The hours for visiting each school. (c) To whom they shall report in each school.

3. They shall be provided with a place in which to work by the principal or teacher in charge of the school or district.

4. They shall report in person to the principal or teacher in charge immediately upon their arrival each day.

5. They shall arrange with the medical inspector assigned to the school or district a method of daily reports of cases to be visited and treated.

6. They shall keep a record of the time of arrival at and departure from each school.

7. They shall keep a record in such form as the superintendent may determine of the name, age, address, disease, and treatment of each pupil examined in school. Also a separate record of all excluded pupils and pupils to be visited.

8. They shall obtain daily a list of all excluded pupils.

9. They shall visit excluded pupils at their homes; *provided*, that such visits shall not be made in cases of smallpox, scarlet fever, diphtheria, measles, whooping cough, or mumps, and shall keep a record of all visits made by them, and the outcome of each case.

10. Revisits shall be made from time to time, if necessary.

11. They shall make personal visits to homes to give necessary instructions or suggestions, and may demonstrate the treatment of pediculosis. In the case of diseases that cannot properly be treated at the home by the nurse or parents, the services of a physician, or treatment at a dispensary, should be urged.

12. Cases of trachoma shall not be treated by the nurses. All such cases should be excluded from school, and the pupil returned only on the certificate of the medical inspector, stating that all danger of conveying such disease by the pupil has passed.

13. If from some unforeseen cause an assistant nurse is unable to attend to her duty, she shall notify the supervising nurse or the superintendent at once by telephone, telegram, or special messenger. This notification shall be followed within five hours by a written application for leave of absence. Before returning to duty after leave of absence exceeding one day for any cause, an assistant nurse shall report in person to the supervising nurse, and shall furnish a certificate from her attending physician, if one has been employed by her during her absence, if the supervising nurse shall so require.

14. Each assistant nurse shall be entitled to four weeks' vacation during each calendar year, to be taken at such time or times as the supervising nurse, with the approval of the director of school hygiene, may appoint.

SALARIES (1907-08).

Director	...	\$3,756.00
Assistant Directors, first year	\$1,800; annual increase \$120; maximum	2,400.00
Medical Inspector, special classes	...	1,008.00
Instructors in athletics	...	1,116.00
Instructor in military drill	...	2,004.00
Armourer	...	1,050.00

NURSES.

Supervising Nurse, first year	\$924; annual increase, \$48; maximum	1,116.00
Assistant Nurses, first year	\$648; annual increase, \$48; maximum	840.00
Temporary and substitute Assistant Nurse, per day	...	2.00

PLAYGROUNDS.

Supervisors of playgrounds, men, morning session	...	4.00
Supervisors of playgrounds, men, afternoon session	...	2.00
Heads of playgrounds, men, one session	...	2.00
Heads of playgrounds, men, two sessions	...	3.00
Heads of playgrounds, women, one session	...	1.20
Heads of playgrounds, women, two sessions	...	2.00
Assistants in playgrounds, one session	...	.80
Assistants in playgrounds, two sessions	...	1.25
Assistants in sand gardens, one session	...	.50
Assistants in sand gardens, two sessions	...	.75
Janitor, morning session	...	1.00
Janitor, afternoon session	...	1.00

PHYSICAL TRAINING.

Special Instructor, first year	\$900; annual increase, \$72; maximum	1,188.00
Special Assistant Instructor, first year	\$612; annual increase, \$72; maximum	900.00
Teachers on playgrounds, after school daily, per day	...	2.00
Teachers on playgrounds, all day Saturday and holidays, per day	...	6.00

THE DEVELOPMENT OF A HEALTH DEPARTMENT.

By E. H. SNELL, M.D., B.Sc., LOND., F.R.S. (Ed.)
Medical Officer of Health, Coventry.

(From the Annual Report on the Health of Coventry, 1907.)

WITH one or two exceptions the health department of a town has been a growth of quite recent development. It was in the first instance forced on all authorities by the Public Health Act of 1875. It is quite certain that if local option in this matter had been predominant, there would be a number of authorities which would still regard such a department as quite a useless redundancy. It is not surprising, therefore, to find that the functions of such a department have often been regarded as excessively limited. This accounts for the fact that in many districts, in order to appear to justify the employment of a whole-time officer as an inspector of nuisances, other quite unrelated duties have been added. In some districts this has been done by making the inspector also the surveyor, or the building inspector, or even the official having to do with the granting of licenses under the Petroleum Acts. Remnants of such an appointment exist in this city, in that your chief inspector is the inspector under the Contagious Diseases of Animals Act. This Act relates to matters which cannot be said to have any direct relation to the health of the inhabitants; it has considerable importance from the point of view of agricultural interests, but that is another matter; the Act is under the supervision of the Board of Agriculture, a Board so active indeed that various notifications that have to be made to it have to be made by telegram: a case of a pig suffering from any illness may be at once suspected as suffering from swine fever; information is telegraphed to the Board, and one or more inspectors from that Board immediately come down to investigate the matter. Nothing but praise can be given to such alertness, but from the point of view of the association of such adventitious work with the health department, there is this to be said, namely, that it is not a good training for sanitary inspectors, in that in the course of time they attach to the occurrence of a case of suspected swine fever among pigs, very much more importance than they do to six cases of typhoid fever among human beings, and a very much larger amount of time and intelligence is devoted to the tracing of the cause of the swine fever. In most districts

this function is allocated to the police, and I venture to opine that it is thus very much better placed than in a health department, whose energies should be better directed into other channels.

In this city there has existed a tendency to place in the health department any functions which do not definitely belong to any other department. In recent years the Shop Hours Acts have been added to that department as a part of its functions. During the past year—and I am bound to add that I advised against it—the “American Gooseberry Mildew Order,” 1907, of the Board of Agriculture has been added. This is an affection of gooseberries, which is neither directly or indirectly related to the health of the community; it is of purely horticultural moment; gooseberries so affected are unsaleable; this affection of gooseberries has therefore no relationship to health. During the past year I was requested by the executive sub-committee of the sanitary committee to report on the “Fertilisers and Feeding Stuffs Act” of 1906. After considerable work I did so, and I showed that the Act, although of agricultural moment, had neither any direct nor any indirect influence on the health of the community, and no action under the Act was taken.

The administration of the Food and Drugs Act is entrusted to your sanitary committee; yet in the main these are Acts directed towards the detection of fraud, and are therefore mostly police matters; to quite a small extent they may be said to be related to the health of the community.

During the last few months the question of the administration of the Education (Administrative Provisions) Act, 1907, has been before some of the committees of your Council, as well as before your Council itself. This is the most important Act relating to the health of the community which has had to be considered for the last thirty-three years, and the opinion has been openly advocated here that the administration of this Act should be entrusted to a new and separate department; having had some experience of both kinds of work, I venture to think that if such opinions should prevail, the real “health” department of the Corporation will in a few years be that controlled by the education committee of your Council.

[Dr. Snell's views on the relation of the Food and Drugs Acts to the health of the community will not, we think, be shared by many medical officers of health. Such matters as the impoverishment of milk and the addition of chemical preservatives to milk and other foods have a very direct bearing on public health, and should be under the control of the medical officer of health. The arsenical beer outbreak has afforded a good example of how the health of the community may suffer from chemical impurities in food.—Ed.]

OBITUARY.

SIR THOMAS STEVENSON, M.D., F.R.C.P., Senior Scientific Analyst to the Home Office, late Medical Officer of Health of St. Pancras.

The death of Sir Thomas Stevenson, which took place on July 27th, has deprived the Society of Medical Officers of Health of one of its oldest and most distinguished members. He was formerly actively interested in the work of the Society, of which he was honorary secretary from 1869 to 1874, and president in the sessions 1877-8 and 1878-9. Although of late years he had been exclusively engaged in analytical work, he was formerly medical officer of health for St. Pancras, where he earned a high reputation as a public health officer. Sir Thomas Stevenson was born at Rainton, in Yorkshire, in 1838, and received his professional training at Guy's Hospital, where he had a brilliant career as a student. He graduated M.D. at the London University in 1864, and became F.R.C.P. in 1871. After some experience in private practice in Bradford, he returned to London and was appointed lecturer in chemistry at Guy's in 1870, and lecturer in forensic medicine in 1878. He was appointed scientific analyst to the Home Office in 1872, and was knighted in 1904. He was public analyst to the counties of Surrey and Bedfordshire and the metropolitan boroughs of St. Pancras and Shoreditch. He contributed many papers to the literature of analytical chemistry, he edited "Taylor's Principles and Practice of Medical Jurisprudence," and with Sir Shirley Murphy, he was joint editor of the well-known "Treatise on Hygiene and Public Health." Sir Thomas Stevenson was, as is well known, engaged as an analytic expert in many criminal trials, in which his unrivalled skill enabled him to render distinguished services to the State.

HENRY CECIL MOORE, M.R.C.S., L.S.A., Medical Officer of Health, Hereford.

Dr. H. C. Moore, who died at Hereford on June 21st, had a remarkable and varied career. Born in Lucknow in 1836, he entered the Royal Engineers in 1857 and served in the suppression of the Indian Mutiny. He was subsequently engaged in important engineering works in the East and in Ireland, and achieved distinguished success; but, unfortunately, he contracted malaria and was invalided from the army in 1866. He then took up medicine as a career, and after studying at Queen's College, Birmingham, he became M.R.C.S. in 1871, and L.S.A. in 1872. In the latter year he was appointed house surgeon at the General Hospital, Hereford, where in 1879 he began general practice. In 1898 he was appointed medical officer of health of Hereford, which post he held up to the time of his death. Dr. Moore was a highly efficient officer, and a man of many-sided activity, and he was held in great esteem throughout his district.

FRANCIS MEAD CORNER, M.R.C.S., L.S.A., J.P., late Medical Officer of Health, Poplar.

Dr. Francis Mead Corner, who died on July 15th, was medical officer of health of Poplar from 1877 to 1892. He was born at Broad Ings, near Whitby, on September 3rd, 1833, and received his medical training as a pupil of the late Dr. Ross, of Shadwell, and at the London Hospital. He became M.R.C.S. in 1854, and L.S.A. in 1855, and in 1856 he began private practice in Poplar, where he was appointed surgeon to the Poplar Hospital for Accidents, to the Royal Naval Reserve, and to the Home for Asiatics. He was keenly interested in social work, and was a member of many charitable organizations and societies in Poplar. He was a man of vigorous and striking personality, eminently fitted for public life, and though his public health work brought him into conflict with vested interests, his integrity and high purpose were universally recognised. His name had become a household word in the district, and all classes of the community received the news of his death with regret. Dr. Corner was formerly a member of the Society of Medical Officers of Health, and served on the council of the Society, with occasional intervals, from 1877 to 1892.

THE POWER OF A DISTRICT COUNCIL TO APPOINT HEALTH VISITORS.—The Wickham Urban District have recently adopted the Notification of Births Act, and it was suggested that a nurse employed by a district nursing association should be appointed as a health visitor by the council, and that she should act under the joint control of the council and the association. The clerk and the solicitor, whilst being of opinion that such an officer could be appointed under the powers of Section 189 of the Public Health Act, 1875, had some doubt whether the fact that the officer, although paid by the council, would not be under their sole control, might affect the appointment, and he accordingly communicated with the Local Government Board upon the matter. The Board replied as follows:—"I am directed by the Local Government Board to acknowledge the receipt of your letter of the 17th inst., relative to the proposal of the Wickham Urban District Council to appoint a lady health visitor. In reply, I am to state that the Board are advised that it is competent to an urban district council, under Section 189 of the Public Health Act, 1875, to appoint a female as assistant inspector of nuisances, and to assign to her the duty of acting under the direction of the medical officer of health as health visitor for the instruction of mothers, with a view to the reduction of infantile mortality. The appointment would not require the Board's approval, and there would be no repayment from the County Fund in respect of the salary assigned to the officer. I am to add that any assistant inspector of nuisances appointed by the district council to act in this capacity should be wholly under the control of the district council, and carry out her duties under the direction and supervision of the medical officer of health."

PROCEEDINGS OF THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED, 1856.

RECONSTITUTED, 1888.

INCORPORATED, 1892.

METROPOLITAN BRANCH.

THE Council presented the following report, which was received and adopted:—"Your Council report that important work has been carried out during the past year (1907-8), by the Metropolitan Branch of the Incorporated Society of Medical Officers of Health, under the Presidency of Dr. Sidney Davies (Medical Officer of Health of the Metropolitan Borough of Woolwich). The Branch held seven, and the Council two meetings. The details of the year's work may be summarised as follows:—

THE EDUCATION (ADMINISTRATIVE PROVISIONS), ACT, 1907.

Medical Inspection of School Children.

The Branch gave very careful consideration to this Act, and, as a result, passed the following resolutions:—

That it is desirable "on the grounds of efficiency, economy, and harmony, that the work of medical inspection should be carried out in intimate conjunction with public health authorities," as enunciated in paragraphs 5 and 6 of the Memorandum of the Board of Education, and that the Metropolitan Cities and Boroughs should for this purpose be made the units of administration.

That the Medical Officers of Health of the Metropolitan Cities and Boroughs be appointed by the London County Council as the local administrative officers, co-operating for this purpose with the Medical Officer of Health of the County of London.

That it is desirable that the necessary executive assistants should be appointed by the London County Council and allocated to the Metropolitan Cities and Boroughs, such Assistants to be under the control of, and to receive instructions from, and to report directly to the Medical Officers of Health of the Cities and Boroughs.

That it is desirable that the Medical Officers of Health should report directly to the London County Council in all matters relating to the administration of the Education (Administrative Provisions) Act.

The Board of Education and the London County Council were asked to receive a deputation from the Branch to discuss the matter. The former body declined, and the London County Council took no action beyond an acknowledgment of the Branch's request.

THE LONDON COUNTY COUNCIL (GENERAL POWERS) BILL, 1908.

The Branch held a Special Meeting to discuss the terms of this Bill, and passed the following resolutions, which were communicated to the London County Council, and to the Metropolitan City and Borough Councils, through their Medical Officers of Health:—

Sections 5 (2) and 6 (2) Unwholesome Milk.

That the attention of the London County Council be drawn to the small penalty provided for in Sections 5 (2) and 6 (2), compared with that provided by the Food and Drugs Acts.

Section 15 (2) Unsound Food.

That Sub-section (2) of Section 15 should end at the word *consumption* in the fourth line, and that the words "and the expression *premises* shall not include a private dwelling-house," be deleted.

Section 21 (a) and (d) Premises used for Sale, &c., of Food.

That the word *aerially* be substituted for the word *directly* in Sub-Section (a) and (d) of Section 21.

That the Hon. Secretary be requested to communicate with the London County Council expressing the satisfaction of the Branch with the Bill as a whole, but suggesting the above alterations and amendments, which in the opinion of the Branch would assist the administration of the provisions.

THE HOUSING, TOWN PLANNING, ETC. BILL.

The Branch considered this Bill, which was promoted by the Right Hon. John Burns, M.P. (President of the Local Government Board). The Branch directed the Hon. Secretary to communicate with the President of the Local Government Board, drawing his attention to the difference in the procedure of appeal against an Order of the Local Authority directed by the Housing of the Working Classes Act, 1890, and the Housing, Town Planning, etc. Bill, as set out in Section 35 of each of those measures. In the former measure, appeal has to be made to a Court of quarter sessions, while the new Bill provides that appeal must be made to the Local Government Board. The Branch were of opinion that confusion might result from this variation in the two measures, as apparently it was not proposed to repeal Section 35 of the Housing of the Working Classes Act. The Branch were also of opinion that in every case the Local Government Board should be the body to whom appeal must be made.

The Branch also suggested to the promoter of the Bill the desirability of inserting a clause into the Housing, Town Planning, etc. Bill, amending the definition of "Owner" given in the Housing of the Working Classes Act, 1890, so as to make such definition identical with the definition of "Owner" contained in the Public Health Act, 1875.

SANATORIA FOR CONSUMPTIVES.

The Branch discussed very fully the question of the provision of sanatoria for consumptives, and finally adopted the principle that sanatoria for poor persons in the Metropolis, suffering from consumption, was needed.

The question as to how effect could be given to this principle was referred to the Council of the Branch for consideration, but the Council were of opinion that it was inadvisable for the Branch to take further action, in view of the fact that the various Borough Councils were approaching the Local Government Board on the matter.

PRESIDENTIAL ADDRESS.

A very interesting and instructive address was given by the President of the Branch (Dr. Sidney Davies), on "Twenty Years' Metropolitan Advance in Preventive Medicine."

VERMINOUS SCHOOL CHILDREN.

Dr. James Kerr (London County Council) read an interesting paper on "Suggestions as to Uniformity and Co-ordination in dealing with Verminous Children."

NOTIFICATION OF BIRTHS ACT, 1907.

The Branch carefully considered the provisions of this Act, and a suggested form of notification was drawn up and forwarded to each Metropolitan Medical Officer of Health.

Officers for 1908-9: President, Dr. W. A. Bond; Vice-Presidents, Dr. Sidney Davies, Dr. P. Caldwell Smith; Hon. Treasurer, Dr. H. W. Roberts; Hon. Secretary, Dr. A. Wellesley Harris.

Representatives of Branch on Council of Society: Drs. F. J. Allan, E. G. Annis, R. K. Brown, L. T. F. Bryett, S. Davies, R. Dudfield, A. W. Harris, Chas. Porter, H. W. Roberts, P. Caldwell Smith.

The above, with Drs. G. F. McCleary, G. Millson, J. Priestley, form the Council of the Branch.

Eastern Counties' Branch.—The Annual Meeting of the Branch was held at Sudbury, on July 18th, 1908. Present:—Drs. Sinclair Holden (President) Collins, Armistead, Cooper Pattin, Pringle and Beach.

The following officers were elected for the Session of 1908-9:—President, Dr. J. N. Collins; Vice-President, Dr. Sinclair Holden; Hon. Secretary and Treasurer, Dr. H. W. Beach; Representative of the Branch on the Council of the Society, Dr. Cooper Pattin.

The President (Dr. Sinclair Holden), read a paper on "The Medical Inspection of School Children in Rural Districts, and its Relation to Medical Officers of Health." All the members present joined in the discussion which ensued. After an adjournment for luncheon, the Mayor of Sudbury and the Surveyor accompanied the Members to the Sudbury sewage disposal station and demonstrated the septic tanks and filter beds. The refuse destructor and pumping station were also visited.

A vote of thanks to the President concluded the meeting.

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. Willesden U.D., 1907, by Dr. William Butler. Report to His Majesty's Secretary of State for the Home Department on the Draft Regulations (June, 1907) proposed by him to be made for factories in which the process of casting brass is carried on, by William Wills, of the Inner Temple, Barrister-at-Law. County of Surrey, 1907, by Dr. Edward C. Seaton. County of Warwick, 1907, by Dr. A. Bostock Hill. Salford C.B., second quarter, 1908, by Dr. C. H. Tattersall. Minutes of the Metropolitan Asylums Board. County of Essex, 1907, by Dr. John C. Thresh. City and

County of Bristol, 1907, by Dr. D. S. Davies. City of Birmingham, 1907, by Dr. John Robertson. Northampton C.B., 1907, by Drs. Jas. Beatty and J. Doig McCrindle. City of Aberdeen, June, 1908, by Dr. Matthew Hay. Portsmouth, 1907, by Dr. A. Mearns Fraser. Shanghai, 1907, by Dr. Arthur Stanley. City of Cardiff, 1907, by Dr. Edward Walford. Report to the Lancashire C.C., by Dr. Edward Sergeant. Special Report on the Outbreak of Food Poisoning in St. Anne's-on-the-Sea U.D., by Dr. Edward Sergeant. Report to the Lancashire Midwives' Act Committee, by Dr. Edward Sergeant. City of Manchester, 1907, by Dr. James Niven. Hertfordshire, 1907, by Dr. Francis E. Fremantle. Report of the Metropolitan Water Board for year ending March 31st, 1908. City of Birmingham, for second quarter, 1908. Salford C.B., 1907, by Dr. C. H. Tattersall. Dr. W. W. E. Fletcher's Report to the L.G.B. upon the Sanitary Circumstances and Administration of the St. Asaph (Flintshire) and of the St. Asaph (Denbighshire) R.D. Sunderland C.B., 1907, by Dr. Henry Renney. Bootle C.B., 1907, by Dr. W. Naylor Barlow. Report of the Midwives Supervising Committee of the City of Manchester for 1907. Report of the Metropolitan Board of Water Supply and Sewerage of New South Wales, July 1st, 1906, to June 30th, 1907.

Journals.

Hospital. Lancet. British Medical Journal. Sanitary Record. Journal of Tropical Medicine and Hygiene. Progress. Transactions of the School Dentists' Society. Transactions of the Royal Academy of Medicine in Ireland. Bulletin of the State Board of Health of Maine. Medical Review of Reviews. Socialist Review. Glasgow Medical Journal. Canadian Nurse. Royal Sanitary Institute. American Journal of the Medical Sciences. Annali d'Igiene Sperimentale. Giornale della Reale Società Italiana d'Igiene. Canadian Practitioner and Review. American Statistical Association. Experiment Station Record. Royal Army Medical Corps. Water. Royal Institute of Public Health. Sanitary Journal. Pacific Medical Journal. Royal Society of Medicine. Birmingham Medical Review.

Statutory Rules and Orders.

Factory and Workshop: Dangerous and Unhealthy Industries. Casting of Brass.

Pamphlets.

Livingstone College Year Book, 1908. Tropical Research in its relation to the Missionary Enterprise. Feeble Minded in Ontario, Second Report and Census, by Dr. Helen MacMurchy.

Bye-laws as to House Drainage and Sanitary Fittings.

Made by the L.C.C. Annotated by Gerard J. G. Jensen, C.E., and another. Sanitary Publishing Company. 3s. 6d. nett.

Your Child's Health.

By Dr. John Grimshaw. J. and A. Churchill, London. 2s. 6d. nett.

The Prevention of Tuberculosis.

By Dr. Arthur Newsholme. Methuen and Co., London. 10s. 6d. nett.

Presentations.

By Sir Ernest Clarke:—The Sanitary Record, Vols. 1 to 17. The Laws Concerning Public Health. Annual Report of the National Board of Health for Washington for 1879 and 1882. Transactions of the Epidemiological Society of London, Vol. 5, Session 1885-6. Local Government, by M. D. Chalmers, M.A., Barrister-at-Law. Hops and Hop Pickers, by the Rev. J. Y. Stratton. Lawes' Public Health Acts. Warlomont's Manual of Animal Vaccination. Sewage: Treatment, Purification and Utilization, by J. W. Slater, F.C.S.

APPOINTMENTS.

J. W. MILLER, M.D. Vict., M.D. Ch.B., Liverpool, D.P.H. Camb., has been appointed Medical Officer of Health for the City of Hereford.

FREDERICK LINTON, M.D. Cantab, has been appointed Assistant Medical Officer of Health for Norwich.

H. A. AHRENS, M.R.C.S., L.R.C.P., has been appointed Medical Officer of Health for the Borough of Basingstoke.

ALBERT E. BRINDLEY, M.D., B.Sc., D.P.H., has been appointed Medical Officer of Health for Derby.

G. SHIELDS, M.B., C.M. Edin., has been appointed Medical Officer of Health for the Queensbury Urban District.

DONALD CAMPBELL, M.D. C.M. Glasg. has been appointed Medical Officer of Health for the Calne (Wilts) Rural District.

HENRY DAVIS, Jun., L.R.C.P. Lond., M.R.C.S., L.S.A., D.P.H. Camb., has been appointed Medical Officer of Health for the Callington (Cornwall) Urban District.

DR. MURPHY has been appointed Deputy Medical Officer of Health for the Kirbymoorside Rural District.

BENJAMIN ISAAC, L.R.C.P., L.R.C.S. Ed., L.F.P.S. Glasg., has been appointed Medical Officer of Health for the district of Cerygydruidion.

WILLIAM HARPER WIGHAM, M.D. Durh., M.R.C.S., has been appointed Medical Officer of Health of South Molton (Devon).

JAMES WOOD, M.B., Ch.B. Vict., D.P.H.R.C.P.S.I., has been appointed Assistant Medical Officer of Health for Oldham.

MISS C. CORBETT, M.B., Ch.B. Vict., has been appointed Assistant Medical Officer of Health for Town Council of Coventry.

H. OSBORNE, M.B., C.M. Aberd., has been appointed Assistant Medical Officer of Health to the Salford Education Committee.

W. HUTT, M.R.C.S., L.R.C.P. Lond., has been appointed Assistant Medical Officer of Health for Warrington.

JAMES MAIR, M.B., C.M. Glasg. has been appointed Assistant Medical Officer of Health for Northampton.

JOHN RONALD CURRIE, B.A. Oxon., M.A. Edin., M.B. Ch.B., D.P.H., has been appointed Assistant Medical Officer of Health for Chester.

LESLIE KINGSFORD, M.D. Edin., D.P.H., has been appointed School Medical Officer in the department of the Medical Officer to the Education Authority of the City of Liverpool.

A. D. EDWARDS, L.S.A. Lond., L.R.C.S., L.F.P.S., M.B., B.S. Lond., B.Sc. Wales, has been appointed Schools Medical Officer under the Bournemouth Education Committee.

ANNIE FLORENCE MARY CORNELL, F.R.C.S., Irel., L.R.C.P. Edin., L.F.P.S. Glasg., has been appointed a Medical Inspector of Schools for the Bristol Education Committee.

WILLIAM STAMFORD, L.R.C.P. Lond., M.R.C.S. Eng., and L.S.A., Medical Officer of Health for Tunbridge Wells, has further been appointed Supervisor of the Medical Inspection of the Elementary Schools' Children.

ERNEST SCOTT GALBRAITH, L.R.C.P. and S. Edin., L.F.P.S. Glasg., D.P.H. Lond., has been appointed Assistant Medical Inspector of Schools to the City of York.

MRS. LUCY PINNIGER, M.B., Ch.B. Glasg., has been appointed Assistant Schools Medical Officer by the Education Committee for Oldham.

Correction.

W. G. WILLOUGHBY, M.D. Lond., the Medical Officer of Health for Eastbourne, is the Medical Officer to the Local Education Authority, and Dr. Alice Oberdorfer is the Assistant Medical Officer. Dr. A. A. Martin holds no appointment under the Local Education Authority, as stated in the August issue.

LAW REPORTS.

HOUSE OF LORDS.

May 8th, 15th, July 24th, 1908.

BEFORE THE LORD CHANCELLOR (LORD LOREBURN), LORDS ASHBOURNE, MACNAGHTEN AND ATKINSON.

WOOD GREEN URBAN DISTRICT COUNCIL v. JOSEPH. Public Health Act, 1875, Sections 4, 13-41—Public Health Acts Amendment Act, 1890, Section 19—Sewer—Drain—Single private Drain.

Behind a row of houses ran a pipe which conveyed the sewage from these houses into the public sewer in the road. The houses drained into this pipe in pairs in a Y shape. Six adjoining houses belonged to one owner. It was admitted that the pipes forming the tails of the Y were sewers within the definition in the Public Health Act, 1875. It was held by the House of Lords that the pipe at the back of the houses was a sewer and not a single private drain within the meaning of Section 19 of the Public Health Act Amendment Act, 1890, and was repairable by the local authority. A pipe, in order to be a single private drain, must be such a pipe as owners could be required to provide under Sections 23 and 25 of the Public Health Act, 1875.

This was an appeal to the House of Lords by the Wood Green Urban District Council, from a decision of the Court of Appeal (reported in PUBLIC HEALTH, Vol. XIX, p. 527), affirming a decision of the King's Bench Division (reported in PUBLIC HEALTH, Vol. XVIII, p. 394), upon a special case stated by Middlesex Justices, in proceedings to recover an apportioned part of the outlay incurred in carrying out certain specified works on a pipe which the local authority alleged was a single private drain.

The owner of the houses contended (1) that the pipe was not a single private drain within Section 19 of the Public Health Act Amendment Act, 1890, and (2) that it did not connect the houses of the defendant with the public sewer. The section provides that "where two or more houses belonging to different owners are connected with a public sewer by a single private drain, an application may be made under Section 41 of the Public Health Act, 1875 (relating to complaints as to nuisances from drains), and the local authority may recover any expenses incurred by them in executing any works under the powers conferred

on them by that section from the owners of the houses It is also provided that "for the purpose of this section the expression 'drain' includes a drain used for the drainage of more than one building."

The justices decided in favour of the owner, and the other courts affirmed this decision.

Sir Robert Finlay, K.C., Macmorran, K.C. and C. Edwards appeared for the appellants, and Danckwerts, K.C. and R. Glen for the respondents. The appeal was dismissed.

LORD ATKINSON read a judgment with which LORDS LOREBURN and MACNAGHTEN agreed. LORD ASHBOURNE delivered a separate judgment, coming to the same conclusion on somewhat different grounds.

LORD ATKINSON in the course of his judgment, said, the facts of this case, as far as material, are as follows: Within the appellants' district are two roads intersecting at right angles. The one Marquis Road, running east and west, in which a public sewer is laid, and the other, Parkhurst Road, running north and south, on the east side of which is situate a row of sixteen houses numbered consecutively from 2 to 32. Six of these, namely, 18, 20, 22, 24, 26 and 28, belong to the respondent and the remaining ten to other owners. At the back of this row of houses and some short distance from them is a line of pipes running parallel with Parkhurst Road, which is connected with and empties itself into the public sewer in Marquis Road. It is styled the single private drain. It would be convenient to refer to it as drain KA. It is laid almost entirely in private ground, but the time when, the person by whom, and the purpose for which, it was constructed is not stated, and for all that appears in the special case, it may have been made before any of the above-mentioned houses were built. The houses in Parkhurst Road are all drained in pairs. The separate drains running from each house of the pair unite at a short distance from their point of departure, and their contents are then carried by a single conduit pipe into the drain KA and through and along that into the sewer in Marquis Road. On October 29th, 1902, a printed notice was sent to the appellants by their own inspector of nuisances that "a drain belonging to the premises 2 to 32, Parkhurst Road," or some one or more of said premises was "a nuisance." The appellants ordered their inspector to inspect the several drains so described. He examined them and reported they were all in a bad condition and required alteration and repair. The appellants on February 11th, 1903, acting on that report, gave notice to the owners of the several houses comprised in the said row, including the respondents, requiring them to execute certain specified works alleged to be necessary to put the said drain KA in proper order and condition. This the owners refused to do. Whereupon the appellants, purporting to act under the powers conferred upon them by Section 19 of the Public Health Acts Amendment Act, 1890, executed the necessary works themselves at a cost of £132 16s. 10d., apportioned this sum amongst the several owners of houses in the row, and sued the respondent summarily before the justices to recover the sum of

£49 16s., his apportioned part of the outlay. The claim was resisted on grounds: (1) that drain KA was not "a single private drain" within the meaning of Section 19 of the said Act of 1890; (2) that it did not "connect" the houses of the defendant with a "public sewer." The decision of the case turns upon the construction of this Section 19. That is a question upon which there has been considerable conflict of judicial opinion. In order to determine what is the particular subject-matter to which the section was intended to apply, it is, I think, necessary to examine the wording of Section 41 of the Public Health Act, 1875, and to consider what is the general nature of the drainage system it was designed by that statute to set up. Having referred briefly to Sections 13-20, he proceeded: Of the remaining twenty-one sections in this fasciculus, nine deal with the duties, powers, and obligations of owners and occupiers of houses within the district of the local authority. By Section 21 the owner or occupier of any such premises is, under certain conditions, entitled to cause his drains to empty into the sewers of the local authority, and by Section 23, that body may require the owner or occupier of any house within its district which is without a drain "sufficient for effectual drainage," to make a covered drain or drains emptying into a sewer which the local authority are entitled to use, not being more than 100 feet from the site of such house, or if there be none such within that distance, then emptying into such covered cesspools or other place as the local authority may direct. And if the owner or occupier fail to execute the works required, the local authority may itself execute them and recover the cost from the owner of the house. Again, Section 25 renders it unlawful, in any urban district, to erect any house, or rebuild any house which has been pulled down to the ground floor, or to occupy any house so newly erected or rebuilt, unless and until a covered drain or drains be constructed in such manner as the officer of the urban authority approves; which shall empty into a sewer which that authority is entitled to use, if within 100 feet of some part of the site of the house so newly erected or rebuilt, or, if there be none such within that distance, then into a covered cesspool or such other place as the authority may direct. Section 40 enacts that every local authority shall provide that all drains and the other sanitary works therein mentioned, shall be constructed and kept so as not to be nuisances or injurious to health. And Section 41 prescribes the machinery by which the owners of houses may, as regards drains and the other sanitary works therein mentioned, "on or belonging to" any premises within their district, be compelled to discharge the obligation imposed upon them by the previous section. If the legislation stopped there, the rights and obligations of the respective parties would be fairly clear. Whether the owner of two or more houses in discharge of his obligation under Sections 22 and 25 of the statute, caused the drainage from each to be carried in a separate and independent drain into "the sewer which the local authority was entitled to use," or to the cesspool they designated for it, or laid their drains so as to unite, and

thereby caused the drainage from several houses to be carried by one conduit from the point of junction to the same sewer or cesspool, was a matter of indifference, so long as the drainage was efficient. This conduit, which may be referred to as the "common conduit," would, according to the ordinary meaning of language, be a "drain"; it would be "single"; would be "private"; would probably be situate, in whole or in part, "on the premises" of the person who constructed; and, even if not, having been made by him to carry off the drainage of his own houses, "would 'belong' to his premises," and he would be obliged to keep it in good order. Neither would there seem to be anything objectionable in the owners of two or more houses providing for the drainage of their houses on a similar plan. The "common conduit" in their case also would most probably be situate on the premises of one or more of them, or, at all events, would "belong to their premises"; would be "single" and "private," and must be properly maintained by those owners whose houses it served. The definition of the word "drain," coupled with that of "sewer," contained in Section 4 of the Act, causes all the difficulty. According to that definition a drain, to be a "drain" within the meaning of the Act, must have as termini at one end one "building, or premises within the same curtilage," and at the other end "a cesspool or other receptacle for drainage, or a sewer into which the drainage of two or more buildings occupied by different persons is conveyed." While the word "sewer" includes sewers and drains of every description except drains to which the word "drain" interpreted as aforesaid applies, and also except drains "vested in or under the control of any authority having the management of roads and not being a local authority under this Act." The consequence is, that in each of the cases above mentioned, by force of this definition, the drain I have designated as the "common conduit," ceases to be a drain, is raised to the dignity of a sewer, and is vested in the local authority, who becomes bound to maintain it at the public expense. These would appear to me to be grotesque results. The statute of 1890 was, I think, passed to correct the second of them, namely, the result where the "common conduit" carried to a sewer, the drainage of two or more houses belonging to different owners. It left the other result untouched. Its object was, I think, to bring within the reach of the machinery of Section 41 of the Act of 1875 one of the two classes of drainage conduits which, by force of this artificial definition of "drain" were placed outside its operation, and to transfer to the shoulders of the owners of the houses which this class of conduits served the burden of maintaining them. But this class, in my view, only comprised conduits which Sections 23 and 25 required the owners to provide or see were provided. As the drain KA does not on the facts stated in the case appear to be one to which Section 23 or Section 25 applies, or one which, irrespective of the definition, would have come within the purview of Section 41, it is not, I think, a "single private drain" within the meaning of Section 19 of the Act of 1890. The second objection is that, even if the drain KA be "a single private

drain" within the meaning of Section 19 of the Act of 1890, it does not "connect" the houses of the different owners in the row with the public sewer in Marquis Road. I think this drain connects the houses in this row with that sewer within the meaning of this section, when it receives the drainage coming from them through sewers made by their owners, and carries that drainage to the public sewer in Marquis Road. On this latter point I think the conclusion of the Court of Appeal was erroneous, but on the whole case I am of opinion that the appeal should be dismissed with costs.

SUPREME COURT OF JUDICATURE. COURT OF APPEAL.

July 15th, 1908.

BEFORE VAUGHAN WILLIAMS, FLETCHER MOULTON,
AND BUCKLEY, JJ.

JONAS BROOK AND BROTHERS, LTD. v. MELTHAM
URBAN DISTRICT COUNCIL.

River Pollution Prevention Acts—Facilities to
Manufacturers—Sufficiency of Sewers—Mean-
ing of "Sewers."

A local authority is not bound to give a manufacturer facilities for carrying liquids from his factory into the sewers of the district, if the works for purifying the sewage are only sufficient for the requirements of the district, although the actual sewer pipes may be more than sufficient.

This was an appeal by the District Council from a decision of a Divisional Court, which reversed the judgment of a county court judge.

The plaintiffs, who are cotton thread manufacturers, complained that the defendant council had wrongfully refused to give them facilities for carrying liquids from their factories into the council's sewers, contrary to Section 7 of the River Pollution Prevention Act, 1876. The defendants refused to give these facilities, because they said the sewers were not more than sufficient for the requirements of the district. It was admitted that the sewage pipes were of sufficient diameter to take the liquids of the factory, but that the purification works were not. The question turned upon the meaning of the word "sewers," in Section 7 of the said Act, which provides as follows:—"Every sanitary or other local authority having sewers under their control shall give facilities for enabling manufacturers within their district to carry the liquids proceeding from their factories or manufacturing processes into such sewers. . . . Provided also that no sanitary authority shall be required to give such facilities as aforesaid where the sewers of such authority are only sufficient for the requirements of their district." The county court judge was of opinion that the word "sewers" in the proviso included not only the pipes which carried the sewage to the purification works, but the whole mass of apparatus which constituted the sewerage system of the district, and that, as that system as a whole was only sufficient for the requirements of the defendants' district, the defendants were not under any obligation to give the facilities asked for; and he

accordingly dismissed the action. The Divisional Court held, on the authority of "Guthrie, Craig, Peter and Co. v. Magistrates of Brechin" (15 Rettie, 385), that the word "sewers" in the proviso meant sewers proper, the actual pipes, and not the whole sewerage system of the district, and reversed the decision of the county court judge.

Scott Fox, K.C., Lowenthal and Theobald Mathew appeared for the defendants; Dankwerts, K.C. and T. E. Ellison for the plaintiffs. The Court allowed the appeal.

VAUGHAN WILLIAMS, L.J., in giving judgment, after stating that the question turned on the meaning of the word "sewers" in the proviso, said that on the policy of the Act, he thought that the word must include the purification works. This was the personal view taken by CHANNELL, J. in the Court below, although he had held otherwise in deference to the decision of the Court of Session in Guthrie and Co. v. Magistrates of Brechin. He did not agree with the Scottish Court, and they were not bound by it. He considered "sewers" should be read in the proviso to Section 7 of the Act of 1876 as covering the whole sewage system.

Fletcher Moulton and Buckley, J.J. were of the same opinion.

July 9th and 21st, 1908.

BEFORE COZENS HARDY, M.R., FARWELL AND KENNEDY, L.J.J.

PRICE'S PATENT CANDLE CO. v. THE LONDON COUNTY COUNCIL.

Nuisance—Sewage-laden water pumped into River Thames—Metropolis Management Acts.

There is nothing in the Metropolis Management Acts authorising the London County Council to pump storm water from their sewers into the Thames in such a way as to cause a nuisance.

This was an appeal from a judgment of Neville, J., holding that the London County Council were not authorised to pump storm water into the Thames so as to cause a nuisance, and that the plaintiffs were entitled to an injunction for nuisance and trespass. The plaintiffs were owners of land and warehouses on the banks of the River Thames, at Battersea. The defendant council, in times of storm had found it necessary, in order to relieve the sewers, to pump the storm water into the river, and had recently erected a pumping station for the purpose. The plaintiffs said that such pumping created a nuisance, by reason of the sewage which was pumped in, and was also a trespass on their foreshore. The defendant council said the pumping station was part of their main sewerage system which they were authorised to construct, and that the pumping was only used when it was necessary to prevent flooding. They denied that a nuisance existed, but if it did, they claimed that they were entitled to pump the storm water in the above manner by virtue of the powers conferred on them by the Metropolis Management Acts. The appeal was dismissed.

COZENS HARDY, M.R., said that what the defendants had done created an intolerable nuisance and the only question was whether they had statutory authority for so doing. The statutes provided that the defendants were not to create a nuisance, and

it was no defence to say that the work could not be done without creating a nuisance. He thought however that the nuisance could be abated at moderate expense.

Fletcher Moulton and Buckley, L.J.J., agreed.

HIGH COURT OF JUSTICE. KING'S BENCH DIVISION.

April 28th, 29th, 1908.

BEFORE CHANNELL AND SUTTON, JJ.

BROOK AND BROTHERS, LIMITED v. MELTHAM URBAN DISTRICT COUNCIL.

River Pollution Prevention Acts—Liquids from Factories—Duty of Authority to Receive—Insufficiency of Sewage System.

A sanitary authority is required to give facilities to manufacturers to enable them to carry the liquids from their factories into the sewers, unless such sewers are only sufficient for the wants of the district. If the sewers themselves are sufficient, the authority cannot refuse such facilities on the ground that the apparatus for purifying the sewage before discharge into a river is not sufficient.

This was an appeal from the county court of Huddersfield in an action brought by Messrs. Brook and Brothers, Limited, cotton thread manufacturers, against the defendant authority for an order that they should be at liberty to carry their liquid refuse into the sewers. Sect. 7 of the Rivers Pollution Prevention Act, 1876, provides that "every sanitary or other local authority having sewers under their control shall give facilities for enabling manufacturers within their district to carry the liquids proceeding from their factories or manufacturing processes into such sewers . . . Provided . . . that no sanitary authority shall be required to give such facilities as aforesaid where the sewers of such authority are only sufficient for the requirements of their district."

The defendant council refused to give these facilities to the plaintiffs on the ground that their sewage system as a whole was only sufficient for the requirements of their district. The sewage pipes were sufficient to take all the liquids of the plaintiffs, but their purification works were not. The purification was carried out by a process known as the Polorite Bacterial Oxidization System. The question, therefore, turned upon whether the word "sewers" in the above-quoted section meant the sewage pipes only or the whole sewage system. The county court judge held that it meant the whole system and dismissed the case.

Dankwerts, K.C., and Wilberforce appeared for the plaintiffs. Scott Fox, K.C., and Lowenthal for the defendants. The Court allowed the appeal.

CHANNELL, J., in his judgment said that as a question of policy and apart from authority he thought that there was very strong reason for holding that the word "sewers" meant the sewage system. He thought, however, that he was not at liberty so to hold. In Guthrie v. Brechin, [15 R. (Ct. of Sess. Rep.), 385], it was held that the word "sewers" referred to the pipes and not to the disposal works. That was a Scotch case, but the act applied to Scotland as well as to England, and he

thought the law should be laid down the same way in both countries. The same view had also been taken by Rigby, L.J., in the Court of Appeal in Eastwood Brothers v. Harley [(1901), 1 Ch. 645]. He thought, therefore, that the appeal must be allowed.

Sutton, J., concurred.

[For full report see Law Reports (1908), 2 K.B., 341.]

BEFORE LORD ALVERSTONE, L.C.J., DARLING AND SUTTON, J.J.

ELDER v. DRYDEN.

Sale of Food and Drugs Acts—Milk—Deficiency in Solids—Presumptions from Analyst's Certificate.

If an analyst's certificate of a sample of milk shows a deficiency in the normal constituents of milk as fixed by the regulations of the Board of Agriculture, the presumption is that the milk is not genuine either by reason of abstraction of solids or the addition of water; and on a summons under Section 6 of the Sale of Food and Drugs Act, 1875, alleging adulteration by adding water, the defendant, in the absence of rebutting evidence, should be convicted, although there was no proof of actual adulteration.

This was a case stated by justices of the County of Durham, on the hearing of a summons by which Dryden, the respondent, was charged with selling, to the prejudice of the purchaser, new milk, which was adulterated with 14.4 per cent. of water, and was not of the nature, substance and quality demanded. The analyst's certificate was put in evidence, in which he stated that when judged by the Sale of Milk Regulations, the said sample showed a deficiency of non-fatty solids corresponding to an addition of 14.4 per cent. of water. It was contended that the charge was bad, because there was no direct evidence of adulteration, and that the defendant should only have been charged with selling milk which was not of the nature, substance and quality demanded. The justices took this view, and dismissed the summons.

Simey appeared for the appellant, Shortt for the respondent.

The Court allowed the appeal, holding that the case must go back to the justices to be dealt with, as the certificate raised the presumptions either that solids had been abstracted, or that liquid had been put in, and was good evidence of either until displaced by evidence to the contrary.

KING'S BENCH DIVISION (IRELAND).

November 18th, 20th and 28th, 1907.

BEFORE LORD O'BRIEN, L.C.J., AND WRIGHT, J.

CORK RURAL DISTRICT COUNCIL v. WALSH.

Public Health (Ireland) Act, 1878, Sections 132-133—Unsound Meat—Being in possession of.

In order that a person may be liable to a penalty for being in possession of unsound meat intended for human food, proof is not necessary that it was being exposed or conveyed for sale.

This was a case stated by the justices of the County of Cork on the hearing of a summons which

charged that the defendant "did unlawfully have in your possession a quantity of meat, to wit, a carcase of a cow intended for the food of man, which meat was unsound and unfit for the food of man and was duly seized, condemned by a justice and ordered to be destroyed." It was proved that the meat had been found in the defendant's slaughter-house and that it was affected with tuberculosis, and that it had been seized and condemned. It was in the process of being dressed and prepared for food. It had only been killed a short time, and the tuberculosis could not have been discovered until the liver and lungs were exposed. There had been no exposure for sale.

The defendant contended that he was not liable to be fined unless there had been an exposure for sale or a conveyance for sale. The justices took this view and dismissed the case.

Bourke, K.C. and Linehan appeared for the appellants; A. M. Sullivan for the respondent. The Court allowed the appeal.

LORD O'BRIEN, L.C.J., in the course of his judgment, said that the question had already been decided in England, in Mallinson v. Carr, [1891] 1, Q.B. 48, and he agreed with that decision. Proof of exposure or conveyance for sale was not necessary and the case should be remitted to the justices to deal with. A person in possession of meat intended for human food and unfit for human food is liable to conviction, and for his own part, he thought such person was liable whether he knew or did not know that the meat was unfit for human food.

Wright, J., concurred.

DIRTY WATER IN MILK.—Ernest Masters, 26, a milk carrier, was charged at Lambeth, on July 29th, with wilfully damaging a pint of milk, value 2d., belonging to his employer, Susan Stevens, who carries on business at Kennington. The prosecutrix had communicated with the police, with the result that in the early hours of Wednesday morning a watch was kept upon the prisoner by detectives. After obtaining his supply of milk from the dairy, the prisoner made his way to a yard, and there filled a large can with water, which he took from an open tub in which only a few minutes previously a man had washed himself. The prisoner poured some of the water into a can and then mixed some milk with it. He was about to deliver the milk and water to a customer when the detective arrested him. Mr. Horace Smith sentenced the prisoner to one month's hard labour.

CHICORY IN COFFEE.—At North London Police Court, on July 17th, the V.V. Bread Company, Limited, was summoned for selling coffee which contained 70 per cent. of chicory. In this case a 3d. tin of coffee was asked for, and the tin was labelled as a mixture of coffee and chicory. The tin contained a 4lb of the mixture. The prosecution contended that these labels or declarations could be used as a cloak for fraud if the proportion of the genuine article was very small. Mr. d'Eyncourt said he found that the chicory was added fraudulently for the purpose of increasing the bulk, and he fined the defendants £15, with £1 11s. 6d. costs.

RECENT PUBLIC HEALTH LITERATURE.

Bacteria.

BERGEY (D. H.) and S. J. DEEHAN. The colon-aerogenes group of bacteria. *Jour. of Med. Research*, 1908, xix, 175.—ELLIS (D.). A preliminary notice of five new species of iron-bacteria. *Three plates. Proc. Roy. Soc. Edin.*, 1908, xxvii, 338.—FICKER (M.). Ueber die resistenz von bakterien gegenüber dem Trocknen. *Zeit. für Hygiene*, 1908, liz, 367.—HIRSCHBRUCH (A.). Die experimentelle Herabsetzung der agglutinierbarkeit beim typhusbazillus durch die Stoffwechselprodukte des *Pyocyanus*bazillus. *Art. aus dem Kaiserlichen Gesundheits*, 1908, xviii, 383.

Brazil.

PEIXOTO (A.). The climate and diseases of Brazil. *Jour. Trop. Med.*, 1908, xi, 214.

Children, Care of.

DOUGLAS (C. C.). The health of school children and its relation to the prosperity of the State. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 330.—JAMES (T. M.). The teaching of hygiene in schools. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 336.—LINDSAY (J. A.). The child brain and education. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 321.

Cremation.

MILLARD (C. K.). Construction and management of crematoria. *Med. Press*, 1908, ii, 114.

Dengue Fever.

ROSS (E. H.). The prevention of dengue fever. *Annals of Trop. Med. and Parasitol.*, 1908, ii, 193.

Diphtheria.

BAGINSKY (A.). Die jüngste diphtherieepidemie und die serum-therapie. *Berl. Klin. Wochens.*, 1908, xlv, 1257, 1319.—MASON (J. W.). Diphtheria in elementary schools and its prevention. *Jour. Roy. San. Inst.*, 1908, xxix, 221.

Disinfection.

McLAUGHLIN (W. B.). A new and efficient method of room disinfection. *Med. Rec.*, N. Y., 1908, lxxiv, 104.—REICHENBACH. Die desinfizierenden Bestandteile der Seifen. *Zeit. für Hygiene*, 1908, liz, 296.—SCHNEIDER (H.). Ueber den desinfektionswert der drei kresol-isomeren in Gemischen mit Seife. *Arch. für Hygiene*, 1908, lxxvii, 1.—SELTNER. Weitere untersuchungen über autandeseinfektion. *Hygienische Rundschau*, 1908, xviii, 689.—UHLENHUTH und XYLANDER. Antiform, ein bakterienautosendes desinfektionsmittel. *Berl. Klin. Wochens.*, 1908, xlv, 1346.

Dysentery.

GUIBAND (M.). La parasitologie de la dysenterie. *Arch. de Med. Navale*, 1908, lxxxix, 367.

Health Resorts.

QUINE (R. H.). The place of the pleasure resort in preventive medicine. *Jour. Roy. Inst. Pub. Health*, 1908, xvi, 347.

Immunity.

BASSENGE (R.). Ueber die Gewinnung von typhustoxin durch Lecitin und dessen immunisierende Wirkung. *Deut. Med. Wochens.*, 1908, xxxiv, 1257.—FERMI (C.). Immunisierung der muriden durch Fütterung mit Wutund mit normaler Nervensubstanz gegen die nachfolgende subkutane infektion von strassenvirm. *Zeit. für Hygiene*, 1908, lx, 221.—KRAUSE und KLUG. Beziehungen zurschen immunität und fermentwirkung. *Berl. Klin. Wochens.*, 1908, xlv, 1454.

Infant Feeding.

BRENNEMANN (J.). Remarks on the feeding of the healthy infant. *Jour. Amer. Med. Assoc.*, 1908, li, 101.

Infection.

CUMPTON (H.). Infectious diseases. *Jour. Roy. San. Inst.*, 1908, xxix, 233.

Kefyr.

GUÉGUEN (M.). Note sur le lait de Kéfir. Sa genèse. Procédés d'obtention sa préparation à l'hôpital maritime de Brest. *Arch. de Méd. Navale*, 1908, lxxxix, 379.

Malaria.

CHAGAS (C.). Beitrag zur malariaphylaxis. *Zeit. für Hygiene*, 1908, lx, 321.—DEADERICK (W. H.). The pathogenesis of pernicious malaria. *Med. Rec.*, N. Y., 1908, lxxiv, 140.—HADJIMICHALIS (M.) and J. P. CARDAMATIS. Report on the work of the Greek Antimalaria League during the year 1907. *Annals of Trop. Med. and Parasitol.*, 1908, ii, 133.

Military Hygiene.

LE GOÏC (V.). L'hygiène des champs de bataille. *Arch. de Méd. et de Pharm. Mil.*, 1908, lli, 24.

Milk.

BIEHLER (MATHILDE). Contribution à l'étude du lait de femme comme source de tuberculose. *Arch. des Méd. des Enfants*, 1908, xi, 473.—DECHERF (E.). Lait modifiés dans leur composition chimique ou moléculaire. *Arch. des Méd. des Enfants*, 1908, xi, 369.—HASTINGS (C. J. C. O.). The national importance of pure milk. *Canad. Pract. and Review*, 1908, xxxviii, 413.—HIAM (L.). The question of sour milk. *New York Med. Jour.*, 1908, lxxxvii, 544.

Mosquitoes.

ROSS (E. H.) and H. C. ROSS. An automatic oiler for the destruction and prevention of mosquito larvae in cesspools and other collections of water. *Plate. Annals of Trop. Med. and Parasitol.*, 1907, i, 165.

Opsonins.

BROWNING (C.). On the nature of the opsonins of normal and of immune sera, and of opsonic effects resulting from the combined action of immune body and complement. *Jour. of Med. Research*, 1908, xix, 201.—COLLINS (J. R.). Opsonins and vaccine therapy. *Med. Mag.*, 1908, xvii, 395.

Paralysis, Epidemic.

STARR (M. A.). Epidemic infantile paralysis. *Jour. Amer. Med. Assoc.*, 1908, li, 112.

Rats.

LANTZ (D. B.). Method of destroying rats. *Pac. Med. Jour.*, 1908, li, 421.—SAIGOL (R. O.). Experiments on "rat extermination." *Indian Med. Gaz.*, 1908, xliii, 254.

Sera.

CARAVIA (E.). Note on Deutschmann's serum against infectious diseases. *Med. Rec.*, N. Y., 1908, lxxiv, 101.—GLAESSNER (P.). Ueber das marmorek-serum. *Deut. Med. Wochens.*, 1908, xxxiv, 1261.—HAENDEL. Ueber komplementablenkung durch antivibrionen und antierythrocyten sera. *Art. aus dem Kaiserlichen Gesundheits*, 1908, xviii, 511.—KRAUS (R.). Ueber Beziehungen des antitoxingehaltes antitoxischer sera zu deren Heilwerte. *Wiener Klin. Wochens.*, 1908, xxi, 1005.—XYLANDER und WOITHE. Ueber eine neue Vorrichtung zur Gewinnung keimfreier sera in grosseren mengen. *Art. aus dem Kaiserlichen Gesundheits*, 1908, xviii, 501.

Sleeping Sickness.

KINGHORN (A.) and R. E. MONTGOMERY. Reports of the "sleeping sickness" expedition to the Zambesi for the years 1907-8. *Annals of Trop. Med. and Parasitol.*, 1908, ii, 53.

INDEX.

ABERDEEN, Countess of, and Prevention of Tuberculosis in Ireland, 234
 Abortion, wilful, means and consequences, 21
 Absentee School Children, Manchester, 165
 Acetanilid, harmful use of, 3
 Accounts, Hospital, Uniformity of Keeping—savings effected by, Barwise on, 68, & see discussion
 Acts of Parliament under which M.O.H. are, have been, and are to be, appointed, 156 et seq.
 Extracts from, and from Administrative Orders concerning appointments of M.O.H., 161
 Administration of the Midwives Act in London—extract from Sir S. Murphy's annual Report for, 1906, (tables), 27
 Charges made by Midwives, 31
 Classes for instruction of Midwives, 31
 Inquests, 29
 Inspection, 28
 Letters of Caution sent—causes—28
 Lists of Births, 30-1
 Lying-in Homes, 31
 Lying-in Hospitals, &c., 31
 Medical Aid Notices, 28-9
 Numbers practising, and Classification, 27
 Puerperal Fever—Cases—distribution, and deaths, 30
 Scholarships, 31
 Still-births notified—details concerning, 29
 Suspensions—Removals—Convictions, 28
 Uncertified Women practising, 27, 28
 Adulteration of Food
 Coffee with Chicory, conviction, 291
 Milk, conviction, 227
 Editorial, 218
 Advance, Metropolitan, in Preventive Medicine [in] 20 years, S. Davies, (tables), 114.
 Aettrycke sub-group of B. Enteritidis, 177
 Africa, South, see Johannesburg, & Pondoland
 Age incidence of
 Diphtheria, W. Australia, (Cumpton on, 183
 Tubercular Infection, Niven on, 57-8
 Aggregation of Population, question of checking, Chalmers on, 223-4
 Agricultural labourers
 not organised, 143
 rates of pay of, 143,
 supplementary allowances to, 143
 rents payable by, 139, 143
 Air, effects of, on Tuberculous Sputum, 56
 fresh, in treatment of Diphtheria, 273

Air Space, in Isolation Hospitals, Corbin on, 73
 in Rural Cottages (Chipperfield), 140
 Vickers on, 155
 Alcohol, use of, Address on, of Berlin School Department, to Mothers, 200
 Alcoholism, parental, effects of, on ante-natal life, Ballantyne & Sullivan cited on, 20-1
 in relation to Infant Mortality (Robb), 162
 in relation to Still-births, Manchester, 18
 and conjoint factors in spread of Phthisis, 110
 Alformant lamp, Disinfection by, Kenwood on, 7, 9, Firth on, 11
 Allan, Dr. F. J., on Disinfection, and on risks with Permanganate, 13, 14
 Altona, Water-caused epidemics at, Cholera, and Enteric, 262
 America, South, see Argentina, & Chili
 America, U.S., see Baltimore, Boston, Massachusetts, New York, Providence
 Meat Inspection Act, 1906, as regards Preservatives in meat for export, 236 et seq.
 Medical Inspection of School Children in, 189
 Medical Inspection in Public Schools in, T. F. Harrington (table), 279
 Ancoats, Still-births in, see Manchester
 Anderson, A., on Desquamation, &c., and Infectivity in Scarlet Fever, 150
 Animals, Bovine, Primary Abdominal and Thoracic Tuberculosis in, King's examination of Carcasses, Table of results, 59
 Unhealthy, as cause of Meat-poisoning, diseases of, 175
 Ante-Natal Life (see also Still-births), loss of, causes of, 19-21
 Anthrax deaths, 1906, County of London, 129
 Antitoxin treatment in Diphtheria Administration, 272
 Dosage, 271
 Early use essential, 271
 Aphasias of Childhood, and Educational Hygiene, C. J. Thomas (diagrams), 90
 Ambidexterity, insistence on, not justified physiologically, 98
 "Auditives," strong and weak, 92
 Auditory word centre, function of, 90, 91
 effect on, of injury, 92
 Brain-centres controlling or connected with Speech, 90
 Dictation lessons, importance of in aberrations of Speech, &c., 98
 Idioglossa, 93
 Kinaesthetics, in relation to Speech and Reading, 91

Aphasias of Childhood (continued)—
 Motor Speech-Centre—function of, 90, 91
 effect on, of Injury, 93
 Visual Word Centre—function of, 90
 great importance of, 94
 "Visuals," strong and weak, 92
 Writing Centre—function of, 90
 Appointments of M.O.H., 203, 252, 287 (& correction)
 Anomalies connected with, in Housing and Town Planning Bill, Herbert Jones, 156
 as certifying officers for Meat Foods for Argentina, 121
 Arabic numerals, easy use of, by Word-blind Children, and others, 96, 97
 Argentina, export of Meat Foods to—certifying officers appointed, 121
 Medical Inspection of School Children in, 189
 Ashby, A., The Death of Dr. W. T. G. Woodforde, 135
 Attack, The, on Infant Mortality, reports on Municipal efforts and others, 43
 Auditory Word-Centre, function of, 90, 91
 effect on, of Injury, 92
 Auditives, strong and weak, 92
 Australasia, ravages of Phthisis among natives of, Power cited on, 53
 Australia, see Victoria
 West, History of Diphtheria in, H. Cumpston, charts & tables 180
 white population in, 180, fluctuation in, 181 et seq.
 BABIES, Healthy, Prizes for, Halifax, 247
 Bacilli, Meat-poisoning, see Bacilli, under Bacteria
 Bacteria
 Bacillus (i)
 Anthracis, as employed in Lister Institute scheme for Standardisation of Disinfectants, 6
 Botulinus, cause of sausage-poisoning, 175, 176
 Coli communis, as effected by experiments in Disinfection, 5
 flaginac type, 260
 in Water Supplies, 260, 261
 and others, destroying B. Enteritidis Gärtner, 179
 Diphtheria, "Carriers" of, preventive treatment for, 273
 Klebs-Löffler, tendency of, to persist in Throat, etc., 148
 Enteritidis (Gärtner's), as cause of Meat-poisoning, 175, et seq.
 entering food during, or after Cooking, 178
 virulence of, 175, 178
 group, in Meat-poisoning, 175, 176
 sub-groups of, 177

Bacteria (continued)

- Klein, in Milk, Orr's investigations, 268 9
 Living, entrance of, in Food to Body, 176
 Meat-poisoning, Meat Poisoning and, G. F. Buchan, 175
 Paratyphosus, A. and B., 177, 178
 Psittacus, in relation to disease resembling Food-poisoning Tuberculosis, in air of Brompton Hospital, 105
 effect of, either Human or Bovine, when fed to Calves, Niven on, 59
 Typhosus, as employed in Lister Institute scheme for Standardisation of Disinfectants, 6
 in Water Supplies, 261
 as affected by Storage, 262
 Cocci (i)
 M. Pyogenes aureus, as affected by experiments in Disinfection, 5
 Pneumococcus, as affected by experiments in Disinfection, 5
 of Scarlet Fever, 148
 Staphylococcus pyogenes aureus, efficiency against, of Formic Aldehyde, Kenwood on, 7
 Streptococcus, as affected by experiments in Disinfection, 5
 Streptococcus conglomeratus of Kurth, Klein's view of identity of, 148
 Streptococci in Yorkshire Milk, 270
 found in Yorkshire Milk, 268 70, distinctions between, 270
 Bacteriological Standardization of Disinfectants, requirements re, of H.M. Office of Works, 4
 Bacteriology, applied to Water-supplies, 259 61
 Bailey, R., dismissal by Bilston U.D.C., Editorial, 216
 Bakehouse, Underground, at Hotel, summons re, 193
 Baltimore, U.S.A., Disinfection in, after Diphtheria, and recurrence of Disease, Chapin on, 83
 Bangor, Enteric at, due to Water-supply, 262
 Barlow, T. W. N., on Sanatoria and Sanitation, in reference to Tuberculosis, 155
 Barnsley, Kendray Hospital at, Methods at, in regard to Scarlet Fever, Sadler on, 151
 Barracks, prevalence in, of Phthisis, 52
 Barttelot, Colonel, M.P., amendment of, to Public Health Bill, 1872, affecting Security of Tenure, 160 1
 Barwise, S., Isolation Hospital Expenses, 68, 71, discussion, 71
 Bathing of School Children, Manchester, 163
 Bed-rooms, fewness of, in Rural Cottages, 139, 140
 Beef, Tubercular exposure of, for sale conviction re, Stratford, 88
 Belgium, Medical Inspection of School Children in, 189
 Beneden, Workers' Sanatorium at, for Consumption, 231

- Berlin School Department, Address of, to Mothers, on use of Alcohol, 200
 Berner St., Elder Boys' Mentally Defective Centre, 187
 Billingham, Mr., on Slate Bed Sewage Purification, 230
 Bilston U.D.C., dismissal by, of Dr. R. Bailey, Editorial, 216
 Birmingham, Efforts at, to Combat Infant Mortality, 41
 Sanitary improvements at, in relation to Rents, McCrindle on, 67
 and other towns disregarding Desquamation as source of Infection, 148 9
 Birrell, Rt. Hon. A., on Prevention of Consumption in Ireland, 235
 Birth-rate for 1907, England and Wales (table), 42
 Liverpool Corporation dwellings, (tables), 65-6, Herbert Jones on, 67
 Births, see also Ante-Natal Life, Child-bed Mortality, Infant Mortality, Notification of Births Act, & Still-births
 Early Notification of, Rotherham, results, 23
 Lists of, furnished by Midwives, London, 1906, 30-1
 Premature, high incidence of, Calcutta, 147
 Blindness, see also Word-blindness due to neglect at Birth, high proportion of, 23
 Blyth, M. W., on Disinfection, 14
 Board of Education—
 Circular of, on Medical Inspection of School Children, with Schedule, 37, & see 1, 32, 173
 New Code of, alterations in, of Public Health importance, 217, 240 et seq.
 Pamphlet issued by, on School Doctors in Germany, 195
 Regulations of, for Training Elementary Teachers 217, 242
 Boards of Guardians, duties of, as to Isolation of Consumptives, 233
 Bollinger's investigations on Meat-Poisoning Bacilli, 175
 Books, School, Disinfection of, Kenwood on, 8, 9
 Boric Acid, &c., in (and as packing for) Meats—
 British practice, 238-9
 Foreign practice, 236 8
 Bostall Woods Open Air School, Tooth-cleaning at, 80
 Boston, U.S.A., Department of School Hygiene of, evolution and organization of, 279 80
 Medical Inspection in Public Schools in, T. P. Harrington, (table), 279
 Botulism, or antitoxin, 175
 Boycott, cited on contents of Sera, and on mistaken cases of Typhoid, 177
 Boys, Word-blindness more frequent in, than Girls, 97
 Brain Centres connected with Speech and its understanding, discoverers of, 90
 Brazilian Coffee sale of, under false Trade Names, 88
 Breast-feeding, at Halifax, 247
 at Rotherham, effects on vitality, 24, 26
 Brecknock Schools for the Mentally deficient, & for the Blind, 187

- Breeding places of House flies, 124
 Breslau, Deafness and Mental Deficiency in School Children at, (Kobrak), 188
 School Hygiene in, 1906 7, (tables), 155
 Bridgman, Laura, 91
 Brieger, discoverer of Ptomaines, 176
 Brineker, J. A. H., on visits to Schools by M. O. H. and others attending Lectures on Medical Inspection of School Children, 186
 Brindley, A. E., on Sanatoria for Tuberculosis, 155
 Bristol, Infant Mortality Statistics for, D. S. Davies (tables & charts), 40
 British Canned Meats, Preservatives in, MacFadden on, 238 et seq.
 British Medical Association, South Staffs. Division, representations of, to Bilston U.D.C., on dismissal of Dr. R. Bailey, 216
 Brixworth R.D.C., Salary of part-time M.O.H. of, Editorial, 256
 Broca's discovery as to production of Speech, 90
 Brock, Dr. W. J., death of, 248
 Brompton Hospital, observations on, 105
 Buchan, G. F., Meat Poisoning and the Meat-poisoning Bacilli, 175
 J. J., Personal Infection in Pulmonary Tuberculosis, (tables), 152, 155, discussion 155
 on Medical Inspection of School Children, 46-7
 Building of Labourers' Cottages, cost of, and effect on Rates (Chipperfield), 139
 Building-materials for Rural Cottages, 144
 Bulstrode, Dr., Report of, on Sanatoria for Consumptives, Editorial on, 51, Niven on, 52 et seq.
 views of, on Infectivity in Pulmonary Tuberculosis, 152 et seq.
 Burdett, Sir Henry, approval by, of Barwise Scheme for Isolation Hospital Accounts, 70
 Burman, F. J., A Country Cousin's views on Public Health, 128
 on Security of Tenure for M.O.H., 147
 on Uniformity in Hospital Accounts, 71
 Burns, Rt. Hon. John, M.P., Bill of, for Housing and City-planning, 137 et seq.
 Butler, W., on Disinfection, 13
 on M. O. H., and Isolation Hospital Expenses, 71
 on Mortality in relation to Habits of the People, 67
 on Sanitary administration and the Housing Bill, 147
 Bye-laws for Rural Building defects in, 140
 elasticity requisite in, 142
 CADÉAC'S experiments on effect of Light on Tuberculous Sputum, 57
 Caiger, F., cited on Semi-separate Cubicles for different Infectious Diseases at South-Western Hospital of M.A.B., 76

- Calcutta, Infantile Mortality in, F. Pearce, 147
 Municipality of, dismissal by, of Dr. Nield Cook, Fremantle on, 44 5
 Calmette's Tuberculin Ophthalmic Reaction as a help in the Early Diagnosis of Tuberculosis, H. C. Lecky, (tables), 60
 view on causes of Tuberculosis, 57, 59
 Calves, effect on, of Tubercle Bacilli whether Human or Bovine, when fed to, 59
 Cameron, Dr., cited on Return Cases, 73
 J. S., Yorkshire Milk, Report on, 263, Editorial on the same, 255
 on risks of proclaiming non-infectivity of Scarlet Fever Desquamation, 151
 Cancer Mortality, persistent rise in, 115
 Cans, Milk, need for greater care with, 266 7, 270
 Carriers of B. Diphtheria, prophylactic treatment for, 273
 Case of Diphtheria in a Horse, A. M. Fraser, 48-9
 Castle, R. F., on second attack of Scarlet Fever in same person, 151
 Carbolic Acid Co-efficients as obtained by Hewlett and Kenwood, 5
 Cassland Road Secondary School, Ventilation at, 186
 Cathcart, cited on virulence of B. Enteritidis Gärtner, 175
 Chadwick, Edwin, pioneer work of, in State Medicine, 29
 J., on Medical Inspection of School Children, 47
 Chalmers, A. K., The Growth of Cities, in relation to Town Planning, (tables) 218, discussion 227
 Chapin, C. V., The Recent Discussion on Disinfection, letter, 82
 Cheapness, equivalent to decadence, in Rural Cottages, 140 1
 Chelsea Polytechnic, course at, in Physical Exercises, for Elementary Teachers, 243 5
 Chemical Examination of Water-supplies, 257, 259
 Chest Examination of School Children, and removal of Clothing, Richard on, 33
 Chester Sewage, crude and treated, organisms in, 258
 Chester-le-Street, Enteric at, due to Water-supply, 262
 Chick, Miss, cited on factors in tests of Disinfectants, 11
 Chicory in Coffee, conviction, 291
 Child-bed mortality, England and Wales, 23
 Childhood, Aphasia of, and Educational Hygiene, C. J. Thomas (diagrams), 90
 in relation to Tubercular Infection, 57
 Children, see also Babies, Birth-rate, Births, Blindness, Childhood, Deaf, Defective, Infants, Infantile, & School Children
 as affected by Infection of Pulmonary Tuberculosis, St. Helens, 153
 education of, in Domestic Economy and Hygiene (Robb), 162, 163

Index.

- Children (continued)—
 with Diphtheria,
 Antitoxin dosage for, 271
 Rest and position for, in bed, 273
 Chili, Medical Inspection of School Children in, 189
 Chipperfield, Rural Housing difficulties at, 138 et seq.
 Cholera, water-caused, Altona, 262
 Chorea, see St. Vitus' Dance
 Christian St., L.C.C. School, Ventilation at, 187
 Churns, bacteriological investigation of, Orr, 270
 Churton, Miss, on the Housing Bill and Sanitary Administration, 147
 Circular of Board of Education, on Medical Inspection of School Children (with Schedule), 37 & see 1, 32, 173
 Cities, British, convinced as to need of open air Sanatoria, 233
 Growth of, in relation to Town Planning, A. K. Chalmers (tables), 218, discussion, 227
 Clean & Dirty Milk, Orr's proposed standards for, 268
 Cleanliness in administration of Antitoxin, McLean on, 272
 of Milk, suggestions for, 266 7
 Cleansing and Disinfecting School Premises and Books, Kenwood on, 8, 9
 Clarke, J. J., M.O.H. Walthamstow, separate-cubicle position designed by, for local Isolation Hospital, 74 6
 Class Hysteria, 14
 Clerkenwell, summons at, re Unwholesome Tinned Fruits, 184
 Clothing, Disinfection of, Kenwood on 10, view endorsed by Firth, 11
 Coates, Dr., experiments of, on effects of Light and Air, on Tuberculous Sputum, 56 7
 on Tubercular Dust and its Infectivity, 53 4
 Coffee, Brazilian—Sale of, under false Trade Names, 88
 Chicory in, conviction, 291
 College Lane School for Physically Defective Children, 186-7
 Collins, H. B., Isolation Hospitals [and Scarlet Fever], letter, 83-4
 in discussion on Rehousing, Liverpool, 66-7
 Cold transport of Hams, &c., unsucccess of, 237
 Common Lodging-houses, Phthisis death-rate in, Niven on, 53
 "Comforter," or "dummy tent," indictment of, 25
 Communicability of Phthisis, J. Niven (table), 52, letter on, W. H. Hamer, 168-9
 Compensation for those dislodged by Rehousing, Liverpool, 62
 Complications in Diphtheria under Antitoxin treatment, McLean on, 272, 273
 due to overcrowding of Fever Patients in a ward, Corbin, 73, 74
 Consumers of Milk, care requisite by to prevent pollution, 266, 267, & see 255
 Consumption, see also Phthisis
 Control of, Editorial, 51
 Air-space in relation to, Prevention of, Vickers on, 155

Consumption (continued)—

- Prevention of, and Fight against Tuberculosis, T. O. Dudfield, 230
 Compulsory Notification, views on of Local Government Boards, 235
 Death-rate, 1906, London, from Tuberculosis, 233
 (Dudfield's report) Editorial 217-8
 I.S.M.O.H. (Met. Branch) memorial of, to Met. Asylums Board, results, 232, 233
 Local Government Board's attitude, 231, 233
 Movement in Ireland, 234
 in Scotland, 235
 National system for Sanatoria, 230
 Official Action, 232
 Poor Law Authorities' Action, 231
 Public Health Authorities' Action, 232
 Southern Hospital (as Sanatorium), 233 4 & note
 Views of International Congresses and of Local Government Boards, 231-2
 Workers' Sanatorium, Beneden, 231
 Congenital, Word-blindness, 96 et seq.
 Word-deafness, 92-3
 Contagious, Impetigo, An Epidemic of, A. E. Porter, 34
 Control of Consumption, Editorial, 51
 of Ringworm in School Children, H. M. Richards, 274
 Convent-life, in relation to Phthisis, 101
 Convictions, relative to Articles of Food—
 Bad Egg Albumen, 81
 Coffee with Chicory, 291
 Milk Adulteration, Hampstead, 227
 Tubercular Beef, 88
 Cook, Dr. Neild, dismissal of, by Municipality of Calcutta, Fremantle on, 44 5
 Cooking, German superiority in, 120
 Corbin, H. E., Isolation in Isolation Hospitals, (plans), 72
 Corner, Dr. F. M., obituary notice, 284
 Cornet's experiments on Infectivity of Tubercular-infected Dust, 53 4, and on Infection due to Moisture expelled in Coughing, 55
 inferences and Statistics of, on Tuberculosis mortality in Prussian Catholic Nursing orders, criticized, 101
 Correspondence:—48, 49, 82 4, 130, 168, 209, 251
 Cost of Cottage-building 139, 142, 143
 Re-housing, Liverpool, actual, 63, anticipated, 62
 Cottages, Cheap, Exhibitions of, at Letchworth, 142, 143
 at Chipperfield, condition of, Fremantle on, 138-9, 140
 Cost of building new, 139
 Rates as affected by building new, 139
 Rents paid for, 139
 Ideal, Fremantle on, 142
 Rural, Adequacy of Housing, 140-1
 Administration, Efficacy of, 141
 Maintenance of, 144
 Cost of Building, Chipperfield, 189, Letchworth, 142-3
 Existing, state of, and defects in, 138-9, 140

- Coughing, Infection of Phthisis conveyed by Moisture ejected during, Flügge's view, 54, Cornet's view, 55
- County Councils, functions of, Fremantle on, 144-5
- M.O.H. to be directly under, 144, 145
- Medical Officer for Inspection of School Children—appointment of, recommended, Kent C.C., 3
- Nursing Associations, need for, in relation to provision of Midwives, 167
- Country Cousin's Views on Public Health, F. J. Burman, 128
- School for Manchester Children, 163
- Coutts, F. J. H., on Tuberculosis Infection, 155
- Coventry, & its Health Department, Snell on, 283, Editorial note, *ib*
- Cow(s), Tuberculous, conviction re, Leeds, 67
- udders of, cleansing of, 255, 266
- Cowsheds, cleanliness and temperature of, 255, 266
- contamination of Milk in, 266, & see 255
- Craven, R. M., seconding Fremantle's resolution re the Government Housing Bill, 147
- Cream, Boracic acid in, conviction re, Westminster, 247
- Preservatives in Milk and, Editorial, 174
- Crookshank, F. G., in discussion of Hope's Paper on Liverpool Re-housing, 67
- Croydon, Control at, of Ringworm in School Children, H. M. Richards, 274
- Cullingworth, C. J., obstetrician, death of, 204
- Cumpston, H., History of Diphtheria in West Australia, *charts & tables*, 180
- Cups, Sacramental, separate, plea for, D. J. Morgan, *letter*, 170
- DAMPNESS and its causes in rural Cottages (Chipperfield), 138, 140
- Darmstadt, School Dental Clinic at, 79, 80
- Davies, Colonel, on Formaldehyde Disinfection in vapour form, 12, 13
- Davies, D. S., Infant Mortality Statistics [for Bristol and Huddersfield], (*tables & charts*), 40
- in discussion on Kenwood's paper on Disinfection, 10
- E. S., on Hospital expenses in relation to number of Patients, 71
- S., Twenty Years' Metropolitan Advance in Preventive Medicine (*tables*), 114
- Deaf children, special schools of L.C.C. for, 186
- Deaf-mutes, kinaesthetic memory in, 91
- Deafness (*see also* Word-deafness) and Mental Deficiency in School Children, at Breslau, (Kobrak), 188
- Death-rates, *see also* Infant Mortality, & Mortality
- Diphtheria, fluctuations in, Davies on, 115, (*table*) 116
- in West Australia, Cumpston on, 181-3

Death-rates (*continued*)—

- England & Wales, 1907, (*tables*), 42, general reduction in, Davies on, 114 *et seq.*
- general, on what dependent, Davies on, 114
- London, reduction in, ratio of, 18.1-1905., 114, *table* of average, 116, of various diseases, 117
- Phthisis, in Common Lodging-houses, Niven on, 53
- Death(s), *see also* Obituary Notices, & Callingworth
- of Dr. W. T. G. Woodforde, A. Ashby, 135
- from Anthrax, 1906, County of London, 129
- Referring of, to Districts, J. H. Garrett, *letter*, 169, H. C. Kidd, *letter*, 209
- Defective Children, Breslau Schools, 155
- German School Doctors' duty to, 197-8
- Special Schools for, of L.C.C., 186 *et seq.*
- Defries, W., on Disinfection, 12
- Delépine, Professor, experiments of, and under, on Tuberculous Sputum, 53, 53
- Dental Caries, commonest disease of civilized Europeans, (Wallis), 78
- Clinics, School, of Germany, C. E. Wallis, 78
- neglect—consequences of, to Children, 80
- Dentist(s), School, Work of, Oliver, Keen, and Elliott on, 201, 202
- in Germany, salaries and hours, 80
- views of, favourable to German School Dental Clinics, 79
- Derbyshire Isolation Hospitals—results of Barwise's investigations as to management and cost of, 68 *et seq.*
- Desquamation in Scarlet Fever, Infectivity of, S. G. H. Moore, 148, 151, discussion, 150-1
- Development, The, of a Health Department, E. H. Snell, 283, Editorial Note, *ib*
- Devizes, Sewage Purification at, by Slate Beds, 229, 230
- Diagnosis, *see also* Serum *dq.*
- between Meat-poisoning by Bacteria and by Toxins, 176
- Early, of Tuberculosis, Calmette's Tuberculin Ophthalmic Reaction as a Help in, H. C. Lecky, (*tables*), 60
- Diarrhoea, as cause of Infant Mortality, Calcutta and England, 147
- Deaths and Flies, Griffiths on, 126
- Death-rate, no marked diminution in, Davies on, 118
- Diblin, W. J., The Purification of Sewage on Slate Beds, 228, 230, discussion, 230
- Diction, importance of, in cases of Speech aberration, Word-blindness, &c., 98
- Diet in relation to Efficiency, Chalmers on, 222
- Dietary, Mobberly Country School for Manchester Children, 164
- Digestive organs in relation to Tubercular Infection—Calmette's view—Niven on, 59

- Diphtheria, average period of infectivity in, Anderson on, 150
- Case of, in a Horse, A. M. Fraser, *letter*, 48-9
- Death-rate (*table*), 116, fluctuations in, Davies on, 115
- Metropolitan Asylums Board Hospitals, since use of Antitoxin, 273
- Disinfection for in America, results as to spread or recurrences with, and without, Chapin on, 82-3
- by Fumigation and by spraying, results, Kenwood on (*table*), 9
- History of, in W. Australia, H. Cumpston, *charts & tables*, 180
- Age distribution, 183
- First recorded case, 180
- Mortality in, case *do.*, 183
- causes of increase in 181-3
- School Influence, 184
- Seasonal Prevalence, 183
- Treatment of, C. J. R. McLean, 271
- General—
- Food, 273
- Medicine, 274
- Rest, 273
- Heart Complications, to be watched for, 273-4
- Local, 274
- Tracheotomy, 272
- Specific—
- Antitoxin, early use essential, 271
- administration of, 272
- complications 272
- dosage, 271
- mortality, 272-3
- Paralysis with, 272
- Prophylaxis, 273
- Tracheotomy, 272
- Polyvalent Antistreptococcus serum, when advisable, 271
- Dirty Milk, (McLay), 168
- Orr's proposed standard for, 268
- Water in Milk, conviction, 291
- Diseases chiefly causing Infantile Mortality in Calcutta, 147
- dealt with by School Hygiene Dept. Boston, U.S.A., 281
- found in School Children at Breslau, 155
- that should be enquired for, in Medical Inspection of School Children, 33
- with Suppurative Skin conditions, and the reverse, relative Infectivity in, Moore on, 148
- Disinfectants, Standardization of, J. T. Ainslie Walker *letter*, (*table*), 48
- Bacteriological requirements of Office of Works, 4
- Scheme for, of Lister Institute, 6
- Tests of, factors conditioning, Miss Chick *et al* on, 11
- Disinfection, Conditions of difficulty—three types of, in occasions for use of Disinfectants, 6
- Extermination of Lice, Firth on, 11
- Recent Discussion on, C. V. Chapin, *letter*, 82-3, C. T. Kingzett, *letter*, 83
- School (for Impetigo), Porter's methods, 36
- Some observations on, H. Kenwood, 2, 14, discussion, 10
- Disinfectants—
- Formic Aldehyde as, modes of use, 7

Disinfection (*continued*)—

- germicidal values of, conditions affecting, 4, *et seq.*
- (or germicides), labelling of packages of, Victorian (Aust.) regulations, 4
- Standardization of, 4
- Bacteriological requirements of Office of Works, 4
- Scheme for, Lister Institute, 6
- Pus, experiments on, of the author, and Hewlett, 5
- Ridding old empty House of Fleas, 7
- School Premises & School Books, (cleansing and Disinfection of, 8, 9)
- Spray, and Fumigation, pros. and cons. of, and table of results, in Scarlet Fever and Diphtheria, 9, 10
- District Council, Power of, to appoint Health Visitors (Whickham case), 284
- Districts, Referring to, of deaths, J. H. Garrett, *letter*, 169, H. C. Kidd, *letter*, 209
- Dittmar, F., on Town Planning, 227
- Doctor(s) (*see also* School Doctors), Function of, in Public Health Administration, Editorial, 89
- Domestic Economy teaching, Manchester schools, 63
- expenditure of the Poor, Hamburg, 120-1
- Dosage with Antitoxin, McLean on, 271
- Dowling, Dr., on Medical Inspection of School Children, 47
- Droplet, conveyance of, Tubercular Infection, Niven on, 103, 106
- Drug treatment of Ringworm, indications for, 274, time taken to cure by, 275-6
- Drugs, Harmful, Free Distribution of, Massachusetts Law Prohibiting, 3
- used in Heart Complications in Diphtheria, 274
- Dublin, Tuberculosis Exhibition at, 234
- Dudfield, T. O., The Prevention of Consumption and the Fight against Tuberculosis, 230
- obituary notice (with portrait), 256
- Duncan, Prof. E., on Town Planning, 227
- Dundee, housing action in, 227
- Town Council, and M.O.H.'s trip to Washington, 245
- Durham, *see* Whickham U.D.C.
- Dust, Tuberculous, as a means of spreading tuberculosis, Niven, 169
- Experiments on Infectivity of, Cornets' and Coates', Niven on, 53-4
- Flügge's views cited, 54
- Dwellings, number of, to Acre, under (a) Garden City bye-laws, 140 (b) Model Rural bye-laws, *ib.*
- owned by Liverpool Corporation, *see* Liverpool, Re-housing
- EAR cavities in relation to persistent Infectivity of Scarlet Fever, Moore on, 148
- Echolalia, nature of, 93
- Edinburgh, Resignation of Sir Henry Littlejohn from post of M.O.H. of, 67

Editorials:—

- Case, A., for Inquiry (Dr. Bailey's, of Bilston), 216
- Control, The, of Consumption, 51
- Death of Dr. Woodforde (by A. Ashby), 135
- Food Regulations of the Local Government Board, 215
- Function of the Doctor in Public Health Administration, 89
- Late Dr. T. Orme Dudfield (*with* portrait), 256
- Milk Adulteration, 218
- Note on Snell's paper, "Development of a Health Department," 283
- Official Schedule, The, of Medical Inspection, 1, & see 32, 37
- Position, The, of the School Doctor in L.S.M.O.H., 173
- Present Position, The, of the M.O.H., 136
- Preservatives in Milk and Cream, 174
- Prevention of Consumption, (Dudfield's Report), 217-8
- Salary of Part-time M.O.H., 256
- Yorkshire Milk Report, 255
- Edlin, H. E., on Medical Inspection of School Children, 47
- Education, *see also* Elementary *do.*, School Children, Schools, &c.
- in relation to St. Vitus Dance, 277-9
- Educational, Hygiene, Aphasia of Childhood and, C. J. Thomas, (*diags.*), 90
- Edward VII., interest of, in checking Tuberculosis, 234
- Egg Albumen, Bad, use of, in Nougat, conviction re, Mile End, 81
- Elementary Education Code, The New, 240
- Attendance, 241
- Exclusion from School, 241
- Hygiene, 240-1
- Meals for School Children, 240
- Medical Inspection, 240, 241
- Premises, sanitation and safety, 241
- School closure, 241
- Elementary Schools, *see* under Schools
- Elevation of dwelling-place in relation to Tuberculosis, 52
- in a room, as conditioning effect on subject of Tubercular-infected Dust, 54
- Elkington, J. S. C., A Case of St. Vitus' Dance (Tasmania). A Copy-book Study, 277
- Elliott, G. W., on the Work of the School Dentist, 202
- Emulsion form of Disinfectant, Kenwood on, 6, 7
- Engineers and Public Health, 89
- England, public opinion in, on Compulsory Notification of Consumption, 235
- England and Wales—
- Chief Vital Statistics for, for 1907, (*table*) 42
- Child-bed Mortality, annual, in, 23
- Death-rate of, diseases in which reduction is greatest, 114
- Infant Mortality in, 1906., 23-4
- Endometritis, causes and consequences of, 19, 20
- Enteric Fever, *see also* Typhoid
- diminished Death-rate (*table*), 116, Davies on, 113
- outbreaks, water-caused, 262
- Environment in relation to Pulmonary Tuberculosis, 51
- versus Heredity, Chalmers on, 221-2

- Epidemic(s) *see also* Outbreaks of Contagious Impetigo, A. E. Porter, 34
- deaths from, in 1907, England and Wales, 42
- restriction of spread of, by removal of Infected persons to Isolation Hospitals, *axiomatic*, 72
- varying virulence of, Corbin on, 72
- Epidemiology, in relation to Water-Supplies, 262
- Epidermis, unaffected by organisms of Scarlatina, according to Moore, 148
- Equifex disinfectant to destroy Lice, Firth on, 11
- Essex, *see* Walthamstow
- Establishment Expenses—Isolation Hospitals, Barwise on, 68 *et seq.*
- Examinations, School, first and later, by German School Doctors, 195, 196, results, 197, time occupied in, 198
- Expenses of Isolation Hospitals, S. Barwise, 68, 71, discussion, 71
- Exhibitions—
- Cheap Cottages, at Letchworth, 142, 143
- Tuberculosis, Dublin, 284
- Eyesight of School Children Manchester, 165
- Medical Inspection of, 32, 34
- FÆCES, conveyance of Tubercular Infection by, Niven on, 104
- Mucus or Milk, presence of, with germ to be destroyed reducing Carbolic Acid Co-efficient, 5, 6
- Family character of Pulmonary Tubercular Infection, Buchan on, 153-5
- Favus, defined, treatment of, Croydon, 276
- L.C.C. special School for, 187
- Feeding (*see also* Breast feeding), of Infants—unwisdom common in, 25
- and Tending of Infants, instruction in, of School-children, Manchester, 163
- Fees for Medical Men called in by Midwives, 168
- Feet, Desquamation of, Infectivity of, views of Martin and Scatterry on, 151
- Female death-rate from Phthisis, now lower than Male, 107
- Fever Wards, Disinfection, regular of, L. Mackenzie, cited on, 18
- Filter Beds, composition, working, cleansing, 261-2
- inadequate to protect Water-supplies, 263
- Filtered Waters, River & Water-Supplies and, A. E. Thomas, (*tables*), 257
- Finch Street, L.C.C. school for Favus, 187
- Firth, Colonel, on his methods of Formic Aldehyde Disinfection, 11
- Fischer, on temperature-resistance of B. enteritidis Gärtner, 175
- Fisher, T., on Medical Inspection of School Children, 47
- Fleas, ridding old Empty House from Kenwood's method, 7, 8
- Floods, effect of, on River water, 25
- Floors, School, washing of, rarity of Kenwood on, 8

- Flügge's views on main source of Tubercular Infection, 54
 Fluntern, Switzerland, first recorded case of Meat-poisoning at, 175
 Fetal life, losses of, Manchester, M. Smith on, 15
 Causes, 19 *et seq.*
 Remedies, actual and required, 21, 22
 Total, 18, 19
 Fetus, development of, 19
 Food, *see also* Adulteration, Convictions, Cream, Fruits, Meat, & Milk
 storage of, in Municipal Dwellings, difficulties of, Symons on, 66
 in treatment of Diphtheria, McLean on, 273
 Ford, Dr., on distribution of Meat-poisoning bacilli, 178
 Formaldehyde, Disinfection by, Davies on, 12, 13
 Formic Aldehyde, Disinfection by, Firth's method, 7, Firth on, 10, 11, Kenwood on various modes of using, 7
 Forsyth, R., on Return Cases, and Desquamation in relation to Scarlet Fever Infectivity, 151
 France, (*see also* Paris), Medical Inspection of School Children in, 189
 Schools of, Overpressure in (Mathieu), 78
 Frankenhausen, Meat-poisoning at, (1888), Etiological importance of, 175
 Fraser, A. M., A Case of Diphtheria in a Horse, *letter*, 48-9
 Free Distribution of Harmful Drugs, Massachusetts Law Prohibiting, 3
 "Freibank" system, the German, Utility of as factor in Social Economy, E. Kanthack, (*tables*), 119
 Classes of Meat Sold at, 119
 Main utility of, 120
 Modification of, at Hamburg, methods in vogue, 119-20
 Fremantle, F. E., Garden City, Rural Housing, and the Government, 137, 147, discussion, 147, resolution, 147
 on Mortality in relation to Habits of the People, 67
 on Uniformity of Hospital Accounts—resolution moved *re*, 71
 Fresh Air for Diphtheria patients, 273
 Freshness of materials essential in tests for Soundness of Meat, 179
 Fruits, Tinned, Unwholesome, summons *re*, 184
 Fumigation and Spray Disinfection, pros and cons of, and table of results in Scarlet Fever and Diphtheria, Kenwood, 9
 Function, The, of the Doctor, in Public Health Administration, Editorial, 89
 GARDEN City, Rural Housing, and the Government, F. E. Fremantle, 137, 147, discussion, 147, resolution, 147
 Administration, efficacy, 141, maintenance, 144
 Government Bill of 1908, Parts I. and III., 145-6
 Garden City (*continued*)
 Housing, adequacy, 140-1, supply, 143
 Practical Utopia (County Councils M.O.H., and Sanitary Inspectors), 144-5
 Rural Housing
 Chipperfield hamlet—illustration of difficulties in, 138 *et seq.*
 Originators of campaign for improving, 138
 Town Planning
 Burns' Bill for, 137 *et seq.*
 Early ideals of, 137
 Letchworth as example, 137
 Principles of, towns evidencing, and needing, 137
 Garrett, J. H., Referring of Deaths to Districts, *letter*, 169
 Garnett, Miss M., evidence of, on Security of Tenure, 159
 Garstang, T. W. H., on Medical Inspection of School Children, 47
 Gärtner, discoverer of *B. enteritidis Gärtner*, 175
 Germany, *see* Altona, Berlin, Breslau, Frankenhausen, Hamburg, Worms
 "Freibank" System in, Utility of, as Factor in Social Economy, (*tables*), Emilia Kanthack, 119
 Medical Inspection of School Children in, 189
 School Dental Clinics of, C. E. Wallis, 78
 School Doctors in, 195-7
 Position of, 202
 Germicidal Values of Disinfectants, variations in 4, 5, regulations of H.M. Office of Works *re* Standardization of Victoria (Australia) *re* labelling of packages of, 4
 Glasgow, Housing in, improvement in, Chalmers on, 220
 in relation to population, area, and vital statistics, 220-1
 Town Planning for, various views, 227
 Gloucestershire, *see* Bristol
 Glucose ferments, and Milk, Orr's results, 269-70
 Goodall, E. W., *cited* on Return Cases, 74
 Government the, Garden City, Rural Housing and the, F. E. Fremantle, 137, 147, discussion, 147, resolution, 147
 Housing and Town Planning Bill, 1908, Parts I. & III., some criticisms, (Fremantle) 145-6
 Gray, D., M.P., memorandum of, to Housing Commission Report, 1885, on Security of Tenure, 158
 Greenwood, Dr., in discussion on Personal Infection in Tuberculosis, 155
 A., on Medical Inspection of School Children, 45, 47
 Griffith, A., The Life History of House-flies, 122, *table*, 127
 Griffith, Dr., on Comparison of Cost in Isolation Hospitals—data needed, 71
 Growth of Cities, *see* Cities
 Guest, Bailie, on Town Planning, 227
 HALF-TIME Medical Officers for School Inspection, Tattersall on, 45
 Halifax, Yorks., Prizes at, for Healthy Babies, 247
 Halliwell, T.O., on Secondary attacks in Scarlet Fever, and on Desquamation, 151
 Hamburg, Form of Freibank at 119
 Meat Inspection at, 119
 Wages of the poor, in proportion to Rent, 121
 Water Supply and Epidemics, 262
 Hamer, Dr., Analysis by, of Cornet's work on Prussian Catholic Nursing, orders *cited*, 101
 view of, on Tuberculosis, 59
 W. H., Communicability of Phthisis, *letter*, 168-9
 Hampshire, *see* Southampton
 Hampstead, conviction for Milk-Adulteration at, 227
 Hams and Bacon, American, Boric Acid in, 237
 Harmful Drugs, Free Distribution of, Massachusetts Law prohibiting, 3
 Harrington, T. F., Medical Inspection in Public Schools (Boston, U.S.A.), (*table*), 279
 Harris, G. M., on the Housing Bill, 147
 Health Certificate of German School Doctors, 196
 Department, a, the Development of, E. H. Snell, 283, Editorial note, *ib.*
 Lectures to Teachers and Parents, by German School Doctors, 198-9; at Manchester, 166
 Health Visitors, attitude to, of Rotherham Mothers, 25
 duties of, as to Ringworm, Croydon, 274, 276
 need of, Davies on, 118
 Power of a District Council to appoint (Whickham case), 284
 Hearing, Manchester School Children, 165
 Heart complications in Diphtheria, to avoid, recognise, and treat, 273-4
 disease after St. Vitus' Dance, 279
 Heat and Cold, as affecting House-flies, 122 *et seq.*
 Height Standard for Medical Inspection of School Children, 33
 Heredity in relation to Pulmonary Tuberculosis, 51
 Tubercular Disease, Buchan, 152, Niven on, 58
 and environment, Chalmers on, 221-2
 Hertfordshire, *see* Chipperfield, & Letchworth
 Hewlett, Prof., and Prof. Kenwood, experiments of, in Disinfection of Pus, 5
 Hibbert, C., on Medical Inspection of School Children, 46
 Hill, Miss Octavia, reclamation by, of population through Housing, 223
 Hogarth, A. H., School Clinics; or Centres for the Medical Treatment of School Children in Populous Districts, 194
 Holiday Schools, Germany, Children with diseased Teeth debarred from, 80
 Holmes, G. W., separate - cubicle pavilion designed by, Walthamstow U.D.C. Isolation Hospital, 74-6
 Home and Hospital conditions contrasted as to Personal Infection in Pulmonary Tuberculosis, Buchan, 152
 Isolation for Scarlet Fever, Malet *cited* on results at Wolverhampton, 72
 Homerton College for Deaf and Mentally Defective Children, 186
 Hooliganism and its Causes, Chalmers on, 221, 222, Guest on, 227
 Hope, E. W., Notes on some of the Results of the Re-housing Operations in Liverpool, (*tables*), 62, 67, discussion, 66
 on Medical Inspection of School Children, 46
 Horse, Case of Diphtheria in a, A. M. Fraser, *letter*, 48-9
 Horse blood serum, peculiarity of, as affecting Antitoxin, 272
 Horse-flesh, consumption of, at Hamburg, 121
 Horsfall, T.C., evidence of, on Security of Tenure, 159
 Hospital Isolation, in relation to Scarlet Fever, Davies on, 117-8
 Hospitals, *see also* Isolation Hospital(s) employing separate or semi-separate rooms for different infectious diseases, 74 *et seq.*
 in Paris, dangers of stay in, due to, Consumptives in Wards, Straus *cited* on, 105
 and Schools, relations between, in regard to Medical Inspection of School Children, Richards on, 34-5
 Hotel, Underground Bakehouse at, summons *re*, 193
 House-degradation, principle and working of, Fremantle on, 141
 House-famine and the Housing Acts, Chalmers on, 223
 House-flies, Life History of, A. Griffith, 122, *table*, 127
 Breeding-places, 125
 Diarrhoea deaths not due to, 126
 Heat and Cold, as affecting, 122 *et seq.*
 Life of, possible duration, 125
 Stages of, 123
 Need of Moisture by, 122, 124
 Uses of, prevention of nuisance from 126-7
 Wintering of, question of, 125
 House-infection of Pulmonary Tuberculosis, rare in Buchan's experience, 154
 House-room physique and efficiency, inter-relation of, Chalmers on, 219 *et seq.*
 Houses, Lofty, drawbacks to, Chalmers on, 224
 Housewifery teaching, Manchester, 163
 Housing, *see also* Re-housing
 Housing and Town-Planning Bill, 1908 [as affecting] M.O.H., 136; Anomalies connected with the methods of their Appointment, Herbert Jones, 156
 as affecting small Urban and Rural districts, 227
 Chalmers on, 218 *et seq.*, 226
 provisions of, 137, criticisms on, 137-8
 Housing question, as affected by Security of Tenure of M.O.H., *see* Recommendations of Royal Commissions, etc.

- Housing (*continued*)—
 evolution of, Chalmers on, 219
 Rents and Wages, Hamburg, 121
 Rural, Adequacy of, 140-1, Supply of, 143, Financial considerations affecting, 143-4
 Housing of Working Classes, improvement in, Burman on, 128
 Housing of Working Classes Acts, 1890 & 1900, both failures (Fremantle), 144
 Housing of the Working Classes Act, 1900, as affecting Chipperfield, Herts, 132, *et seq.*
 as applied in Liverpool, 62 *et seq.*
 Housing of Working Classes Act Amendment Bill, Select Committee of House of Commons on, recommendations of, as to Whole-time, and Security of Tenure of M.O.H., 160
 Howard, Ebenezer and his precursors in the planning of "Garden Cities," 137
 Huddersfield, Infant Mortality at, Efforts to Combat, 43
 Statistics for, D. S. Davies, (*tables & charts*), 40
 Return Cases of Scarlet Fever at, under old and new system of Detention of Patient, 142
 Sanatorium at, for Scarlet Fever, daily Cost of Patients at, 149-50
 Hugh Myddleton Schools, for ordinary and for Defective Children, 187
 Husbands and Wives, mutual Infection of, with Phthisis, Longstaff on, 107-8, other views, 108-9, *tables*, 109
 with Pulmonary Tuberculosis, Buchan, 153-4
 Hygiene, Educational (*see also* School Hygiene), and Aphasia of Childhood, C. J. Thomas, (*diags.*) 90
 General, in Elementary Schools, (new code), 240-1
 in the Merchant Service, National Standards of, (Howard-Jones), 205
 Lectures on, to Pupil Teachers, Manchester, 166
 Hysteria, Class, 14
 IDEAL Cottage, The, Fremantle on, 142-3
 Cost, and Sanitary fitness, *ib.*
 Idioglossa, nature of, 93
 Immunity to Tubercular Infection, Buchan on, 155
 Impetigo, Contagious, An Epidemic of, A. E. Porter, 34
 Disinfection methods used, 36
 Symptoms of, 35
 INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH
 Alterations in Articles of Association, 206
 Council, 208
 Membership, 206-7
 Name of Society, 206
 Notices, 208
 Officers of the Association, 207-8
 Subscriptions of Members, 207
 Terms employed, 206
 Incorporated Society of M.O.H. (*cond.*)
 Case of D. N. Cook (dismissal by Calcutta Municipality) proposed action by Society, Fremantle and others on 44-5
 Council, *see also* Alterations
 Representatives to, from Eastern Counties Branch, 286
 Metropolitan Branch, 286
 North-Western Branch, 82
 Elections of Fellows and Members, 44, 82, 131
 of President, 131
 Extension of Membership, 173
 Fremantle on the case of Dr. Nield Cook, 44-5
 President, illness of, 44
 recovery of, 206
 Meetings
 Extraordinary General, 206, 250
 General, 44, 82, 131
 Provincial, 249
 Papers read before, 45, 82, 131
 Position in, of the School Doctor, Editorial, 173
 Resolutions reformation of School M.O. Section, 188, and *see* Editorial, 173
 Fremantle's proposed, on the Government Housing Bill, 147
 Sanitary Officers of Army and Navy Medical Staffs, as members of the Society, Fremantle on, 45
 Vote of Congratulations to Dr. A. Newsholme, 44
 EASTERN COUNTIES BRANCH:—
 Election of President, Officers, and Representatives on Council, I.S.M.O.H., 286
 Meeting, Annual, 286
 Papers read before, 286
 METROPOLITAN BRANCH:—
 Elections of President, Officers, and Representatives on Council of I.S.M.O.H., 286
 Memorial of, to Metropolitan Asylums Board on Sanatoria for Consumptives, 232, 233
 Papers read before, 286
 Presidential Address, 286
 Report of Council for 1907-8., 285
 MIDLAND BRANCH:—
 Meetings, 250
 Resolution *re* dismissal of Dr. Bailey, by Bilston U.D.C., 250
 NORTH-WESTERN BRANCH:—
 Appointment of Representative on Parent Council (Dr. Barlow), 82, to other Councils, 131
 Discussions, 170, 171, on Children's Charter of Health, 45
 Medical Inspection of School Children: Speakers
 Buchan, Dr. J. J., 46-7
 Chadwick, Dr., 47
 Dowling, Dr., 47
 Edlin, Dr., 47
 Fisher, Dr. T., 47
 Garstang, Dr., 47
 Greenwood, Dr. A. (opener), 45, 47
 Hibbert, Dr. C., 46
 Hope, Dr. E. W., 46
 Marsh, Dr. J., resolution *re*, carried, 47
 Martin, Dr., 47
 Niven, Dr. J., 46

- Incorporated Society of M.O.H. (contd.)
 Pilkington, Dr. H. O., 46
 Sergeant, Dr. E., 46
 Talent, Dr., 47
 Tattersall, Dr. C. H., 15^c
 Thomas, Dr., 47
 Wheelton, Dr., 47
 Elections and nominations of
 Fellows and Members, 45,
 82, 131, 170
 Exhibits, 170
 Meetings, Ordinary, 45, 82, 131,
 170
 Nominations, 45, 131
 of President for Parent Society,
 (Dr. Sergeant), 82
 Papers read before, 82, 131, 171
 Presentation to Dr. Meredith
 Young, 45
 Resolutions re
 Disinfectants, 170
 Medical Inspection of School
 Children, 46 7
 Presentation to Society of
 Portrait of Dr. Vacher, 170
 SOUTHERN BRANCH :—
 Discussions, 131
 Meeting, Ordinary, 131
 Papers read before, 131
 YORKSHIRE BRANCH :—
 Annual Dinner, 250
 Elections, 171
 Meeting, Ordinary, 171
 India, see Calcutta
 Industrial centres, change in
 character *pari passu* with
 area and population ex-
 pansion, 224
 Infant(s), Infantile, Infantine :—
 Deaths of, under 3, and under 12
 months, Manchester, with
 causes (tables), 19
 Feeding and Tending of, teaching
 of, to School children, Man-
 chester, 163
 Overlaying of, Mrs. Greenwood on,
 205
 with diseased Teeth rejected in
 German Schools, 79, 80
 Life, Parental Sobriety and Intelli-
 gence as affecting, 66, and
 see 162
 Mortality, The Attack on, 43
 Calcutta, F. Pearce, 147
 Effect on, of the Trained Midwife
 A. Robinson, (table), 22
 England and Wales, 1906., 23
 Paisley, causes and suggested
 remedies (Robb), 162
 Statistics for Bristol and Hudders-
 field, D. S. Davies, (tables
 & charts), 40
 for England and Wales, 1907.,
 42
 Infection,
 Personal, Firth on, 11
 in Phthisis, Niven on, 52
 in Pulmonary Tuberculosis, J. J.
 Buchan, tables, 152, 155,
 discussion, 155
 in relation to Pulmonary Tubercu-
 losis, 51
 in Tuberculosis, Age-incidence of,
 Niven on, 57, 58
 "Infectious," vague use of term, 152
 Infectivity of Desquamation in Scarlet
 Fever, S. G. H. Moore, 148,
 151, discussion, 150-1
 Bacteriological considerations
 adverse to Infectivity of
 Skin, 148
 Desquamation defined, 148
 Nose and Ear, as regions in
 which Infection persists,
 148

- Infectivity of Desquamation in Scarlet
 Fever (continued)
 Skin, Anatomy and Conditions of,
 in relation to Infectivity,
 148
 Statistical considerations sup-
 porting negative view, 148
et seq.
 Phthisis, under-rated, Niven on, 104
 of Scarlet Fever, commencement
 and duration of, 148
 Inquests on cases where Midwives
 have been in attendance,
 London, 1906., 29 30
 Inquiry, into Still-births occurring
 in Manchester since 1905,
 Some Observations on,
 Margaret M. Smith, (tables),
 15
 into Yorkshire Milk, see Yorkshire
 Milk
 Insecurity of Tenure, ill-effects of, on
 M.O.H., and on Rural and
 other Sanitation, 141-2
 Inspection, *see also* Medical Inspection
 of Midwives, London, 28
 of Rivers, course and banks, 257-9
 Intelligence and Sobriety—associa-
 tion of—effect of on Infant
 Life, Hope on, 66
 Inter-departmental Committee on
 Physical Degeneration,
 1904, views of, on Security
 of Tenure, 158
 Intermarriages, decrease in, in rela-
 tion to diminished Phthisis
 Death rate, Niven, 107
 International Congresses, views of,
 on Consumptive Sanatoria,
 232-3
 Intestines in relation to Tubercular
 Infection, Niven on, 57, 59
 Intra-natal loss of Life, causes of, 21
 Ireland, *see also* Dublin
 Compulsory Notification in of
 Consumption, Consultation
 Committee in favour of, 235
 L.G.B. in favour of, 235
 Fight with Tuberculosis in, Dud-
 field on, 230, 234
 Midwives in, training, &c., 23
 "Irrecoverable," rates, nomad de-
 faulters, 221
 Isolation Hospital(s), A. E. Porter,
 (letter), 130
 Expenses, S. Barwise, 68, 71,
 discussion, 71
 Classification under Isolation
 Hospitals Act, 68
 Sub-divisions adopted by
 author, 69
 Isolation in, H. E. Corbin, (plans), 72
 Acute and Convalescent cases,
 classification of, into differ-
 ent wards, 73
 Air Space—amount less vital
 than separateness of, 73
 Cases requiring complete Isola-
 tion, 73
 Complications arising from in-
 adequate Isolation accomo-
 dation, 73, 74, 78
 Kaye's views cited, 72
 Malet's experience of Home
 and Hospital Isolation for
 Scarlet Fever, 72
 Millard's views cited, 72
 Report of London Fever
 Hospital, 1862, cited on
 results of its work—objec-
 tion quashed by, 72-3
 Restriction of spread of Epi-
 demic disease, by removal
 of, infected persons to
 Hospitals, axiomatic, 72

- Isolation Hospital(s) (continued)
 Single rooms *versus* Wards,
 successes compared, 74
 Hospitals using, 74 *et seq.*
 Length of Stay in, of Scarlet
 Fever Patients, Moore on,
 149 50
 Scarlet Fever, and, H. B. Collins
 letter, 83

- JAPAN, Medical Inspection of School
 Children, in 189-90
 Jessen, Prof., of Strasburg, successful
 efforts of, in promoting
 School Dental Clinics in
 Germany, 78 80
 cited on the large return and low
 cost of School Dental
 Clinics, 80
 Jewish mothers, a tribute to, (Scur-
 field), 22
 Johannesburg, mine-work at, as a
 cause of Phthisis among
 Natives, 53
 Johnstone, Mrs. Heywood, resignation
 of, 204-5
 Jones, Herbert, Housing and Town-
 Planning Bill. Medical Offi-
 cers of Health. Anomalies
 connected with the methods
 of their Appointment, 156
 on Fremantle's paper (in reference
 to Houses at Chipperfield),
 147
 on Hope's paper on Re-housing at
 Liverpool, 67
 on Hospital Accounts in Rural
 districts—ration system
 condemned by, 71

- KANTHACK, Emilia (Mrs. G. de Voss),
 The Utility of the German
 Freibank System, (table) 119
 Kaye, J. R., cited on Isolation policy
 and factors involved in
 forming view on, 72
 Keen, E., on the Work of the School
 Dentist, 201
 Keller, Helen, 91
 Kendray Hospital, Barnsley, methods
 at, in treatment of Scarlet
 Fever, Sadler on 151
 Kensington, Borough of, working in,
 of Notification of Births'
 Act, 1907 (Dudfield), 2
 Borough Councils & others, efforts
 to establish Metropolitan
 Sanatoria, 231
 Kent, *see* Beneden, & Woolwich
 County Council, appointment (pro-
 posed) of County M. O. for
 Inspection of School Chil-
 dren, 3
 Kenwood, H., Some Observations on
 Disinfection, 2, 14, discus-
 sion, 10, & *see* Letters, 82-3
 Kerr, Dr., first to describe and explain
 Congenital Word-deafness,
 92-3
 pioneer "School Doctor," 190
 Kidd, H. C., The Referring of Deaths
 to Districts (letter), 209
 Kinæsthetic memories, aid given by
 to the
 Word-blind and, 95, 97, 98
 Word-deaf, 91
 King Edward's Hospital Fund—
 savings effected by, uni-
 formity of accounts insisted
 on by, 68, 70
 King, J., observations by, on relative
 frequency of Primary Ab-
 dominal and Thoracic Tu-
 berculous in Animals, 59

- Kingsley, Canon Charles, works of,
 assisting improved Housing
 of the Working Classes, 138
 Kingzett, C. T., The Recent Discus-
 sion on Disinfection, letter,
 83
 Klein, Prof., views of, on the Specific
 Micro-organism of Scarlet
 Fever, 148
 Knight, J., on Desquamation and In-
 fection in Scarlet Fever,
 150
 on Town Planning, 227
 Koch, Prof. R., experiments by, re
 Spontaneous Tuberculosis
 in Guinea-pigs and Rabbits,
 55, 59
 standard of, for Sand-filtered
 Waters, 260
 view of, on Hereditary Tendency to
 Tubercular Disease, 58
 Kussmaul's discovery of the Brain-
 centre for understanding
 seen Words, 90
 LABELS on Disinfectants, Kenwood
 on, 4
 on Preserved Meats, Macfadden on,
 239
 Lambeth, conviction at, for Dirty
 Water in Milk, 291
 Lancashire, *see* Liverpool, Manches-
 ter, St. Helens
 Insanitary Rural Cottages in, 140
 Latency period in Tuberculosis, as
 assumed at Manchester, 102

LAW REPORTS

HOUSE OF LORDS—

- Cameron v. Youngs—Landlord
 and tenant—Insanitary
 house—Infectious disease
 —Right of occupiers other
 than tenant to recover
 damages, 210
 Montgomery & Co., Ltd., v.
 Council of the Burgh of
 Haddington—Public Health
 Laying Sewers—Powers
 under various Acts, 210
 Wood Green Urban District
 Council v. Joseph—Public
 Health Act, 1875, Secs. 4,
 13-41—Public Health Acts
 Amendment Act, 1890, Sec.
 19—Sewer—Drain—Single
 private drain, 287

SUPREME COURT OF JUDICATURE—

Court of Appeal—

- Fergusson v. Malvern Urban
 District Council—Nuisance
 —Escape of sewage—
 Pollution of water—Water
 from the defendant's land
 —No right to use the
 water, 210
 Jonas Brook & Brothers, Ltd., v.
 Meltham Urban District
 Council—River Pollution
 Prevention Acts—Facili-
 ties to manufacturers—
 Sufficiency of sewers—
 Meaning of "sewers," 289
 Price's Patent Candle Co. v.
 The London County Council
 —Nuisance—Sewage-laden
 water pumped into River
 Thames—Metropolis Man-
 agement Acts, 290

HIGH COURT OF JUSTICE—

- King's Bench Division—
 Bromley Borough Council v.
 Cheshire—Public Health
 Act, 1875, Sec. 41—Public

Law Reports (continued)—

King's Bench Division (contd.)—

- Health Acts Amendment
 Act, 1890, Sec. 19—Single
 private drain—Work done
 by local authority on de-
 fault of owner—Right to
 recover—Compliance with
 Act, 85
 Brook & Brothers, Ltd., v.
 Meltham Urban District
 Council—River Pollution
 Prevention Acts—Liquids
 from factories—Duty of
 Authority to receive—In-
 sufficiency of sewage sys-
 tem, 290
 Brown v. Butler—Negligence—
 Water supply—Pollution
 by sewage—Typhoid fever
 —Damages, 211
 Cullen v. McNair—Sale of Food
 and Drugs Act, 1875, Sec. 3
 —Cream mixed with bor-
 acic acid—Sale of such as
 cream, 213
 Elder v. Dryden—Sale of Food
 and Drugs Acts—Milk—
 Deficiency in solids—Pre-
 sumptions from Analyst's
 certificate, 291
 Farmer v. Long—Public Health
 (London) Act, 1891—Nuis-
 ance—Procedure—Leaking
 drain, 211
 Fergusson v. Malvern Urban
 District Council—Nuisance
 —Escape of sewage—Pol-
 lution of water—Outbreak
 of typhoid fever—Alleged
 contributory negligence, 86
 Newbury v. Perowne—Warranty
 —Sale of Tuberculous Bul-
 lock—Duty of vendor, 212
 Rees v. Davis—Sale of Food
 and Drugs Act—Milk—
 Warranty—Passing on
 warranty given by farm,
 233
 Sale of Food and Drugs Acts—
 Milk Sample taken by
 Assistant Inspector—Pro-
 ceedings by Inspector, 134
 Wilkinson v. Alton—Margarine
 Act, 1887, Sec. 3—Meaning
 of "margarine"—New but-
 ter substitute, 212
 Wilson's Music and General
 Printing Co. v. Finsbury
 Borough Council—Metro-
 polis Management Act,
 1855, Sec. 250—Public
 Health (London) Act, 1891,
 Sec. 3—Drain or sewer—
 Nuisance—Compliance
 with notice under protest
 —Right to recover, 85

Chancery Division—

- Owen v. Faversham Corporation
 —Sewage Pollution—Oys-
 ter beds—Injunction, 253

KING'S BENCH DIVISION (Ireland)—

- Cork Rural District Council v.
 Walsh—Public Health (Ire-
 land) Act, 1878, Sec. 132-
 133—Unsound meat—Being
 in possession of, 291

Borough and Police Courts—

- A tuberculous cow, 67
 Boracic acid in milk, 247
 Chicory in coffee, 291
 Dirty water in milk, 291
 Malt vinegar, 121

Law Reports (continued)—

Borough and Police Courts (contd.)—

- Medical Officers and the Work-
 men's Compensation Act,
 245
 Milk, 239
 Milk adulteration, 227
 Tubercular beef, 88
 Underground bakehouse, 193
 Unwholesome tinned fruits, 184
 Using bad egg albumen in
 nougat, 81

- Lawton, W. A., organiser of Lectures
 and Demonstrations on Me-
 dical Inspection of School
 Children, 185, vote of
 thanks to, 188

- Lecky, H. C., Calmette's Tuberculin
 Ophthalmic Reaction as a
 Help in the Early Diagno-
 sis of Tuberculosis, (tables),
 60

- obituary notice, 132

- Lectures (*see also* Health *do.*), and
 Demonstrations on Medical
 Inspection of School Chil-
 dren, 185

- resolution re formation of School
 M. O. Section of the
 I.S.M.O.H., carried, 188, &
see Editorial, 173

- Schools visited, 188 *et seq.*

- Leeds, Conviction at, re Tuberculous
 Cow, 67

- Leicester, Desquamation disregarded
 in, results, 149

- Letchworth Garden City, 137

- Cheap Cottages Exhibitions at,
 142, 143

- Cost of building Cottages at, 142,
 143

- example of Town Planning, 137

- Lendet, on Marriage as affecting Phi-
 thisis Infection, 108-9

- Left-handed Children, mistake of
 forcing to become Right-
 handed, 99

- Library, The, 50, 84, 132, 171, 209, 251,
 253

- Liee, Disinfection for, and destruction
 of, Firth on, 11

- Licensed property as affected by
 Re-housing—Liverpool, 63

- Life History, The, of House-flies,
 A. Griffith, 122, table, 127

- Light, effects of,
 on Tubercular-infected Dust, 54
 on Tubercular Sputum, 56-7

- Lincoln, Water-supply, measures to
 purify, 261, 262-3

- Lister Institute, the, and the Stand-
 ardization of Disinfectants,
 4, 6

- Lithiby, J., views of, on Security of
 Tenure, 157, 158, given in
 evidence, 159-60

- Littlejohn, Sir Henry, Resignation of,
 67

- Liverpool, comparative freedom of,
 from Infectious Disease,
 Hope on, 67

- Re-housing Operations in, Notes on
 some of the Results of,
 E. W. Hope, (tables), 62, 67,
 discussion, 66

- Liverpool and other cities in favour
 of open air Consumptive
 Sanatoria, 233

- Local Government Board :—

- action of, as to Salaz, Brixworth
 R.D.C.'s part-time M.O.H.
 250

- action of Officials of, as to Isolation
 of Consumptives, 233

Local Government Board (*contd.*)—
 approval by, of Barwise's scheme for Isolation Hospital Accounts for Derbyshire, 230
 attitude of, to Compulsory Notification of Consumption, on, 231, 235
 to establishment of Poor Law Sanatoria, 231, 233
 to Security of Tenure, 156, 160
 Circular of, on Boracic Acid in Milk, 174
 Food Regulations of, *editorial*, 215
 Orders, affecting Tenure of M.O.H. (and others), 161
 on power of District Council to appoint Health Visitors, 284
 Powers of, as to Appointment Tenure of Office, etc., of Poor Law M.O.H., 161, 2
 as to Town Planning, &c., 137, 8
 Report to, on Preservatives in Meat, by Macfadden, summarized, 236
 sanction of, to resolution of adoption of Notification of Births' Act, 1907., 3
 Utopian suggestions *re*, Fremantle, 145
 Local Government Board, Ireland, and Compulsory Notification of Consumption, 235
 Local Government Board, Scotland, and Prevention of Consumption, 233, 235
 Local treatment in Diphtheria with Antitoxin, McLean on, 272, 274
 London, *see also* Clerkenwell, Hampstead, Kensington, Lambeth, Metropolitan, Mile End, North London Police Court, St. Pancras, Stratford, Walworth, West Ham, Westminster
 Administration in, of the Midwives, Act, extract from Sir S. Murphy's annual report for 1906, (*tables*), 27
 Death rate(s), average, 116
 reduction in since 1861, Davies on, 114
 from Tuberculosis (1906), 233
 various diseases, 116, at various periods *ib.*
 Notification of Phthisis in—results, Niven on, 103
 Poor, Sanitary state of, Simon *cited* on, 220
 Security of Tenure in, of M.O.H., 158, 159
 Water-supply, 263
 London Boroughs which have, and which have not, adopted the Notification of Births Act, 1907., 2, 3
 London, County of, Anthrax deaths in, 1906., 129
 London County Council, Special Schools of, visits to, 186
 London Fever Hospital, Classification of Acute and Convalescent Cases into different wards in, 73
 objections to concentration in, 72, quashed by results, (Report for 1862 *cited*), 72, 3
 proposed new Ward Blocks with Isolation Cubicles at, 76
 Longstaff, Dr., conclusions of, as to Marital Infection with Phthisis, 107, 8
 Loss of Words from fatigue, help in, from Visual Centre, 94

Lying-in Homes in London, 31
 Hospitals in London, *ib.*
 Women, risks and needs of, Robinson on, 22-3
 Smith on, 20, 2
 McCLEARY, G. F., on Photographic records of bad Sanitary Conditions, 66
 McCrindle, J. D., on Rentals and Sanitation, 67
 Macfadden, A. W. J., Report of, to L.G.B. on Preservatives in Meat, (*tables*), summarized, 236
 McLean, C. J. R., Treatment of Diphtheria, 271
 Macmorran, A., K.C., view of, on Security of Tenure, 156
 Male full-term Infants, Mortality of higher than Female, 16
 Malet, H., *cited* on Home and Hospital Isolation for Scarlet Fever, 72
 Malt Vinegar—fine for false description, 121
 Manchester, Marriage as affecting Phthisis Infection at, 109 & *table*
 Phthisis data as collected in, 102
 Notification of, operation of, 110, 111
 School Hygiene in, 163
 Still-births occurring in, since 1905, Inquiry into, Some Observations on, Margaret M. Smith, (*tables*), 15
 Marsh, J., on Medical Inspection of School Children, 47
 Martin, A. W., on Medical Inspection of School Children, 47
 F. W. on Desquamation and Infectivity in Scarlet Fever, 151
 Massachusetts, U.S.A., Law of, prohibiting Free Distribution of Harmful Drugs, 3
 Two Milk-borne Outbreaks of Typhoid Fever in, 2
 Meals for School Children, provision of, Manchester, 165
 regulations of New Code, 240
 Measles Death rate, 116, comparatively slight decrease in, Davies on, 117, *table* 116
 Meat, *see also* Beef
 Preservatives in, (Macfadden's Report to L.G.B.), (*tables*), 236
 (a) Home practice, 238
 (b) Foreign practice (American), 236-7
 Information desirable on foreign and colonial regulations, 239
 Places of preparation, 239
 Presence of Preservatives in Raw Materials, 236
 Proprietary Antiseptics, 239
 Sausages, preservatives in, 239
 Starch in Potted Meats, 239
 Soundness of, Tests for, 178, 179
 Tuberculous, &c., as sold by German "Freibank" and at Hamburg, 119 *et seq.*
 Meat-Foods for Argentina, appointment of M.O.H. as certifying officers, 121
 Meat-Inspection at Hamburg, 119
 Meat-Poisoning and the Meat-poisoning Bacilli, G. F. Buchan, 175
 Bacilli of, Botulinus, 175, 176
 of Enteritidis group, 175, 176, sub-groups, 177

Meat-Poisoning, &c. (*continued*)—
 Bacilli of (*continued*)—
 distribution, 178
 means of identification, 177
 period of access to meat, 178
 by Bacterial Infection, 175-6
 by Toxins, 176
 diagnostic difference between, 176
 First recorded case of, 175
 Living Bacilli entering Body in Food, 176
 Most important case of, 175
 Practical points in case of outbreak, 179
 Ptomaines, 175
 discovered by Brieger, 176
 Sausage poisoning, bacillus of, 175, 176
 Tests of Soundness of Meat, 178, 9
 Toxins, two classes of, 176
 Medical aid called in by Midwives, 168, in London, 1906., number of notices sent, 28, 9; in Rotherham, 24
 Examination, how differing from Medical Inspection, 1
 Medical Inspection of School Children—
 Appointment (proposed) of County M.O. for, Kent C.C., 3
 Circular of Board of Education on, 173
 Cost, in Germany, 199
 Discussion on, by North-Western Branch of I.S.M.O.H. (for Speakers' names, *see* under that head), 45-7.
 Germany, *see* Germany, School Doctor
 History and Practice of, C. J. Thomas, 189
 Aims of, 190-1
 Bill for passed, 190
 Co-operation of Teachers, 193
 Countries carrying on, 189, 90
 Details of, 191
 Items of Schedule, 191-3
 Kerr's appointment, evolution of the system, 190
 Presence of Parents at examinations, 191
 Records, 191
 Rheumatism in Childhood, importance of, 193
 Time occupied by examinations, 191
 Half-time officers for, Tattersall on, 45
 how differing from Medical Examination, 1
 Lectures and Demonstrations on, 185
 resolution *re* formation of School M. O. Section, 188
 Schools visited, 186 *et seq.*
 Methods and Aims of, H. M. Richards, 31
 Actual instances of condition encountered, 34
 Advice and hints to Parents when present during, 34
 Apparatus required, 33
 Height Standards, 33
 Weighing Machines, 33
 Eye-work, room for, 32, prov. sional, &c., 34
 Patience requisite in Inspector, 34
 Place for Inspection, 32-3
 Register, The, 31
 Removal of Children's clothing remarks on, 32, 33
 Role of the Teacher, 31-2, 34

Medical Inspection of School Children (*continued*)—
 Methods and Aims of (*continued*)—
 Schedule of Board of Education, 32
 Details of, 33
 Order of—departure from, at Croydon, 32
 Standard, and Regularity, 33
 Subsequent Procedure, 35-6
 Time required for Inspection, 32
 Conclusions, 35-6
 Official Schedule of, Editorial, 1, and *see* 32, 37
 Provisions *re* of New Elementary Education Code, 240, 241
 Physiology in relation to Education, 89
 in Public Schools; Boston, U.S.A., T. F. Harrington, (*table*), 279
 Boston department of School Hygiene, evolution and organisation of, 279, 80
 Diseases dealt with, 281
 Infectious diseases, cases since introduction of School Nurses, 281
 rules for Nurses as to, 281
 Nursing division, work of, 280-1
 Officials, 280
 Duties, 281, 2
 Salaries, 282
 Physic training, three essentials of, 280
 Playground equipment, and teachers, 280
 Staff, requisite proportions for, Tattersall on, 45
 at Worms, *table*, 113
 Medical Officers of Health:—
 Appointment of, Anomalies connected with, in Housing and Town Planning Bill, Herbert Jones, 156
 Extracts from Acts of Parliament and Administrative Orders concerning, 161-2
 Memorandum prepared by the late W. T. G. Woodforde, upon the Public Health Bill, 1872., 160-1
 Recommendations of Royal Commissions, &c., in favour of Non-lapsing, 158 *et seq.*
 Direct employment of, by County Councils, 144, 145
 of Dundee, Town Council and proposed visit of, to Washington, 245
 Half-time, for School Inspection, Tattersall on, 45
 List of suitable men for, a suggested, Fremantle on, 145
 Part-time, Salary of (Brixworth R.D.C.), Editorial, 256
 Present Position of the, Editorial, 136
 School-children on duties of, 230
 Security of Tenure for, Burman on, 129, 147
 Editor on, 136
 Fremantle on, 141, 2
 Jones (Herbert) on, 156 *et seq.*
 Whole-time only, a desideratum, 144
 "Workman" under Compensation Act, legal decision, 245
 Medical profession as affected by Midwives' Bill, 168
 Medical treatment, in Diphtheria, 274
 of School Children in Populous Districts: School Clinics or, A. H. Hogarth, 194
 Medicine (*see also* Preventive *do.*), in relation to Public Health, 89

Memory centres, variable and lacking in Children, 98
 Mental Deficiency and Deafness in School Children, at Breslau, (Kobrak), 188
 pictures associated with words—instances, 94
 Methods and Aims of the Medical Inspection of School Children, H. M. Richards, 31
 Merchant Service, Hygiene in, National Standards of, (Howard-Jones), 205
 Metropolis, *see* London
 Metropolitan advance in Preventive Medicine [in] 20 years, S. Davies, (*tables*) 114
 Metropolitan Asylum Board:—
 Hospitals of,
 Diphtheria Mortality in, with Antitoxin, 273
 North-Western Hospital, semi-separate cubicles in, 76
 Return Cases of Scarlet Fever in, 149
 Memorial to, on Sanatoria, from I.S.M.O.H. and results, 231, 232, *see also*, 217
 Metropolitan Sanatoria, efforts of Public Health authorities to establish, 230
 Michael Faraday School, Walworth, bad state of School Children's Teeth in, 78
 Midwife (wives)
 cautioned, suspended, prosecuted, convicted, London, 28
 Charges made by, London, 1906., 31
 Classes for further training of, London, 31
 Difficulty of making a living for, in early years, 22, 25
 Inspection of, London, 28
 Medical Aid called on by, London, 28, 9
 Ministrations of, and advice to mothers—as means of combating Infant Mortality, 23, 27, 43
 Number of, in London, 27
 Uncertified, 27, 28
 Registration, 167
 Scholarships for, London, 31
 Supply of, 167, 204
 Trained, and her effect on Infantile Mortality, A. Robinson, (*tables*), 22
 Midwives' Act:—
 Administration of, in London, from Sir S. Murphy's annual report for 1906 (*tables*), 27
 advantages of, Burman on, 128-9
 County Nursing Associations, 167
 Fees for Doctors called in by Midwives, 168
 Medical Profession as affected by, 168
 Notes on, 167, 204
 Overlaying, Mrs. Greenwood on, 205
 Report of Central Midwives' Board (1907-8), 204
 Rural Midwives Association, 205
 Mile End, E., conviction at, *re* use of Bad Egg Albumen in Nougat, 81
 Milk, *see also* Cream, & Faces
 Adulteration, conviction, Hampstead, 227
 Editorial, 218
 Bacteria found in, Orr's investigations, 268-70
 Clean and Dirty, Orr's remarks on, 268
 Dirty (McLay), 168

Milk (*continued*)—
 Dirty Water in, conviction *re*, 291
 Incorrectly designated, conviction, West Ham, 239
 Town and Country, Orr's investigations, 267-9
 Tuberculous, in relation to Phthisis, Niven on, 57
 Yorkshire, Report on, J. S. Cameron, 263, Editorial on, 255
 Milk and Cream, Preservatives in, Editorial, 174
 Milk and Glucose Ferments, Orr's investigations, 269, 70
 Milk Consumer, hints to, Yorkshire Report, 266, 267, and *see*, 255
 Conveyor, *see* Railway
 Producers and Retailers, hints to, Yorkshire Report, 266
 samples, Bacteriological examination of, difficulties of, 264, 5
 Milk-borne Out-breaks of Typhoid Fever, Two, in Massachusetts, 2
 Milk-maid, evanishment of, in relation to diminished Female death-rate from Phthisis, 107
 Milkers, cleanliness in, suggestions *re* 266, 267, and *see*, 255
 Millar, F. G., *cited* on Tuberculous Disease in Pondoland—its causes and spread, 53, 58
 Millard, C. K., inquiry by, on Desquamation in relation to Scarlet Fever Infectivity—replies, 149
 views of, on Isolation Hospitals and Scarlet Fever, *cited*, 72
 Mine compounds as factors in spread of Phthisis, S. Africa, 53
 Minister and Board of Public Health, desiderata, Burman on, 129
 Mobberly, Country School at, for Manchester Children, 163-5, equipment, dietary, time-table, 164
 Moisture, need of, by House-flies, 122, 124
 Montpellier House, Open-Air L.C.C. School, 187
 Moore, A. E., (*sec.* Society for Destruction of Vermin), The War on Rats, letter, 251
 Moore, Dr. H. C., obituary notice, 284
 S. G. H., The Infectivity of Desquamation in Scarlet Fever, 148, 151, discussion, 150-1
 More, Sir Thomas, "Utopia" of, on Town-Planning, 137
 Morgan on distribution of Meat-poisoning bacilli, 178
 Dr. Pringle, first to describe case of Word-blindness, 97
 Mortality, *see also* Child-bed, Diphtheria, & Infant
 England and Wales, 1907, Analysis of, (*table*), 42
 in relation to Habits of the People, Hope on, 64, Butler on 66, Fremantle on, 67
 of Phthisis, Statistics of, factors influencing diminished death-rate on, Niven, 106 *et seq.*
 relative, in Large, and in Cottage Municipal Dwellings, R. C. Smith on, 66
 of Typhoid, and Paratyphoid, 178
 from Tuberculosis in Convents, 102
 Mothers, (Berlin), Address to, of School Department, on use of Alcohol, 200
 education of, on care of Infants (Robb), 162

Mothers (continued) —

- Jewish, a tribute to (Scarfield), 22
 occupations of, in relation to numbers of live children born to them — average and total — and of Still-births and miscarriages, Manchester and Ancoats, 1905 and 1906, (tables), 17, 18
 School for, St. Paneras, 43
 Motor Aphasia, case of, 93
 Motor Speech Centre — function of, 90, 91
 effect on, of injury, 93
 loss of control of, consequences, 92
 Mouth, throat and nostrils, treatment of, in Diphtheria, with Antitoxin, McLean on, 274
 Mucus, see Faeces, Mucus or Milk
 Mulhausen, School Dental Clinic at, 79, 80
 Municipal Dwellings, see also Rehousing, Liverpool
 Mortality, relative, in Large and in Cottage, P. C. Smith on, 66
 treatment of Ringworm, Croydon, 274-5, 276
 Murphy, Sir S., Administration of the Midwives' Act in London (extract from annual report for 1906), (tables), 27
 on Fremantle's paper on Housing Bill, 147
 cited on Progress of Public Hygiene, 114 *et seq.*
 Muschamp, R., on Scarlet Fever complications during Convalescence and on Return Cases, 151
 Muscles, voluntary, as affected by St. Vitus' Dance, 279
 NAKED Germ Tests, see Disinfection, by Kenwood
 National Association for Sanatoria for Tuberculosis, first building opened, 231
 Standard of Hygiene in the Merchant Service (Howard-Jones), 205
 System of Sanatoria for Consumptives, Dudfield on, 230
 New York, Diphtheria mortality in, in relation to Antitoxin dosage, 271
 Medical Inspection of School Children in — part time officers for, Tattersall on, 45
 Newsholme, A., views of, on Personal Infection in Pulmonary Tuberculosis, 152
 Vote of Congratulations to, from I.S.M.O.H., on appointment as Chief M.O. to L.G.B., 44
 Nineteen hundred and seven, Vital Statistics for the year, from Quarterly return of Registrar General, Jan., 1908, (table), 42
 Niven, J., Communicability of Phthisis (table), 52, 101
 on County Medical Officers of Health, resolution *re*, 46, carried, 47
 views of, on Personal Infection in Pulmonary Tuberculosis, 152
 Norfolk, case in, of failure of co-operation between Medical man and Midwife, 168
 Northamptonshire, see Brixworth
 Norway, Medical Inspection of School Children in, 189

- Nose, the, &c., in relation to prolonged Infectivity of Scarlet Fever, Moore on, 148
 Notes on the Midwives Act, (see also Midwife), 167, 204
 Notification of Births Act, 1907 — working of in Kensington — Councils having and having not, adopted (Dudfield), 2, 3
 Early, of Births — good results from, Rotherham, 23 *et seq.*
 Compulsory of, Consumption, Dudfield on, 231
 Osler on, 234
 views of Local Government Board on, 235
 Compulsory (general), in W. Australia, 183
 Phthisis, anticipations and results, Niven on, 103, 110
 Bulstrode's Report discussed as to, 111
 Burman on, 120
 effect on Death-rates, 111
 Ringworm, Croydon, 274
 Scarlet Fever, Davies on, 117-8
 Tuberculous Complaints, Bulstrode's views, (Editorial), 51, Niven's observations thereon, 52
 Voluntary of Diarrhoea, at Woolwich, 118
 Phthisis, a failure, Davies on, 115
 Tuberculosis at St. Helens, 152
 Nougat, use of Bad Egg Albumen in, conviction *re*, Mile End, 81
 Nurses, State Registration of, Bill for, 167
 Nurses' Directory, Bill for, fate of, 167
 Nursing division Boston (U.S.A.), Department of School Hygiene, work of, 280-1
 OBITUARY NOTICES, see also Deaths
 Brock, Dr. W. J., 248
 Corner, Dr. F. M., 284
 Dudfield, Dr. T. Crme, (with portrait), 256
 Lecky, H. C., 132
 Moore, Dr. H. C., 284
 Ridge, Dr. J. J., 205
 Stevenson, Sir Thomas, 284
 Woodforde, Dr. W. T. G., A. Ashby, 135
 Oceania, islands of, ravages of Phthisis in, 53
 Official Schedule, The, of Medical Inspection, Editorial, 1, & see 32, 37
 Oliver, J., on the Work of the School Dentist, 201
 Open-air Schools
 Bostall Woods — Tooth cleaning at, 80
 Montpellier House, 187
 Organic matter as affecting efficiency of Disinfectants, 5, 6
 Organisation, capacity for, in relation to Memory, 98
 Organisms in Water Supplies, two groups of, 259
 Orr, T., Bacteriological investigations of, into Yorkshire Milk, 264-5, 267 *et seq.*
 Orton, J., on Town Planning and recreation grounds, 227
 Osborne Place School for Physical & Mental Defectives, 187
 Osler, Prof. W., on Compulsory Notification of Consumption, 234
 Outbreaks (see also Epidemics) of Typhoid Fever, Two, in Massachusetts, 2

- Overcrowding, in Hamburg, 121
 in relation to Phthisis, 52, 53
 in relation to Tuberculosis, 109
 on Site, Rural, and Urban, 140
 Overlaying, Mrs. Greenwood on, 205
 Overpressure in Schools of France (Mathien), 78
 Owen, and other precursors of Howard of "Garden City" fame, 137
 PACKING, of Meat, &c., Preservatives used as, penetrative power of, Macfadden on, 237-8
 Paisley, Infant Mortality in, causes, and suggested remedies (Robb), 162
 Paraphasia, nature of, 95
 Paralysis after Diphtheria, McLean on, 272
 Paratyphoid Fever, bacillus of, 177
 mortality of, 178
 Parents, advice and directions to, resulting from Medical Inspection of School Children, Richards on, 34
 Evening lectures to, on Dental Hygiene, Germany, 79
 Health Lectures to, by German School Doctors, 198-9
 presence of at School Medical Examinations, Thomas on, 191
 Parents and Teachers, Health Lectures to, Manchester, 166
 Paris, Pasteur Hospital in — Isolation Chambers in, Martin cited on success of, 74
 Tuberculosis in Hospitals in, Straus cited on, 105
 Parkes, L. C., on Disinfection, 13
 Part-time M.O.H., Salary of (Brixworth R.D.C.), Editorial, 256
 Pasteur Hospital, Paris — Isolation Chambers in, Martin cited on success of, 74
 Pathology in relation to the School, 89
 Patients' expenses — Isolation Hospitals, Barwise on, 68 *et seq.*
 Pearse, F., The Infantile Mortality in Calcutta, 147
 Pearson, Prof. K. cited on Hereditary tendency to Tubercular disease, 58-9
 Permanganate - formalin Disinfection, Firth on, 11, risks of, Allan on, 14, Rideal on, 12
 Permanganate of Potassium, results of attempted Disinfection by, of Pus, 5
 Personal Infection in Pulmonary Tuberculosis, J. J. Buchan, (tables), 152, 155, discussion, 155
 Phenol, Germicidal equivalent of, required to Sterilize Pus, 5
 Phonetic and other systems of teaching to read, Thomas on, 99, 100
 Photographic records of Bad Sanitary Conditions, McCleary on, 66
 Phthisis, see also Consumption, Tuberculosis, &c.
 Communicability of, J. Niven, (table), 52, 101, letter, W. H. Hamer, 168-9
 Age in relation to, 57-8
 Anthropoid Apes and Tubercular infection, bovine or human, 101
 Bang's story illustrative of Tubercular Infection, 104
 Basis of disagreement with Report, and praise of it in other respects, 113
 Bovine sources of the disease, 59, in young children, 57, 58

Phthisis (continued) —

- Communicability of (continued) —
 Bulstrode's view stated and combatted, 52 *et seq.*
 Causes of the spread of the disease, 52 *et seq.* 102
 Dust, infected with dried Tubercular Sputum, 53-6
 Moist infectious particles, ejected by Coughing (Flügge's views on), 54
 Overcrowding, 52-3
 Spitting, 53, 102
 in Convents, 101, high mortality from, 102
 Conclusions as to nature and spread, 103
 Death rates from, effect on, of Notification, difficulty of gauging, 111-2
 London and seven other towns, table, 112
 Effects of Air on Tuberculous Sputum, 56
 Light on Tuberculous Sputum experiments on, 56-7
 Freedom from the disease of British Hospital Staffs, 104-6
 French Hospitals and institutions in other countries, incidence of Phthisis in, or in region of, 106
 Heredity in relation to, 58
 Husbands and Wives as mutually infecting, Longstaff's thesis, 107-8, others' views, 108-9, table, 109
 Infectivity of under-rated, 104
 Latent Tuberculosis, 58
 Manchester methods of fact-collecting, 102
 Mortality among Prussian Catholic Nursing orders — Cornet's inferences criticized, 101
 Mortality statistics, factors influencing diminished death-rate, 102, 106 *et seq.*
 Notification, results, 103
 Period commonest between Infection and Death, 101
 Predisposing Factors, 109
 Prophylactic measures, increased interest in, 103
 Sexual influence as affecting, 58, & see 107-9
 "Simple Contagion theory," 104, discussed, 105
 Sputum in relation to, (a) Dry, in Dust, 53
 (b) Moist, in Cough-expelled Particles, 53-7
 "Sub-infectious," term not justified, 104
 Three lines of attack, 110-11
 Tuberculosis in Animals
 Primary Abdominal and Thoracic, King's Observations (table), 59
 views and experiments on, of Cadeac, 57
 Calmette, 57, 59
 Coates, 53-4
 Cornet, 53-4
 Delépine, 56
 Flügge, 54
 Hamer, 59
 King (table), 59
 Koch, 55, 58, 59
 Millar, (Dr. F. Grant), 53, 58
 Pearson, 58-9
 Ransome, 56
 Villemin, 52-3, 58
 Von Behring, 57

Phthisis (continued) —

- Compulsory Notification of, Burman on, 129
 Death-rate 111, 112, (table) 116, diminution of, Davies on, 115
 Infection of, from person to person, Niven on, 52
 Physical efficiency and Housing, Chalmers on, 220, *et seq.* 224
 Exercises, Manchester Schools, 163
 Training in, of Elementary School Teachers, 242
 Training, three essentials of, 280
 Physiology in relation to Education, 89
 Pilkington, H. O., on Medical Inspection of School Children, 46
 Play-ground equipment and teachers, Boston, U.S.A., 280
 Plehn, Dr., cited on relationship between Individual and State, 143
 Plenum system of Ventilation, L.C.C. Schools, 186, 187
 Pneumonia, liability to, of Diphtheria patients, 273
 Poisoning, see Meat Poisoning
 Pollution of Milk, where greatest, 255, 226
 precautions against, suggested, 266-7, 270
 Rivers, sources of, protection against, 257-9
 Polyvalent Antistreptococcus Serum, in forms of Diphtheria, McLean on, 271
 Pondoland, ravages of Tuberculosis disease in — how induced, Millar cited on, 53, 58
 Poor Law Authorities Action of, as to Metropolitan Sanatoria, 231
 Population, dislocation of, during Rebuilding, 222
 Town, Density of, in relation to Physical efficiency, 222
 Populous Districts, Centres for Medical Treatment of School Children in: School Clinics or, A. H. Hogarth, 194
 Porter, A. E., An Epidemic of Contagious Impetigo, 34
 Isolation Hospitals, letter, 130
 Position of the School Doctor in I.S.M.O.H., Editorial, 173
 Pregnancies, Occupation of Mothers during, as affecting Stillbirths, &c., Manchester, 18
 Successive, as affecting loss of ante-natal life, 21
 Premature Births, see under Births
 Premises, where Meat is Preserved, Macfadden on, 239
 Preservatives in Meat, 236
 in Milk and Cream, Editorial, 174
 Prevention of Consumption (Dudfield's report), Editorial, 217-8
 Prevention of Consumption and Fight against Tuberculosis, T. O. Dudfield, 230
 Preventive Medicine, epoch of discovery in, 279
 Twenty Years' Metropolitan Advance in, (tables), S. Davies, 114
 Prisoners, why, specially liable to Phthisis 52
 Prizes for Healthy Babies at Halifax, 247
 Proprietary Antiseptics, Macfadden on, 239
 Prophylaxis, Antitoxin hints on, McLean, 273

- Providence, U.S.A., Disinfection for Diphtheria at, results with, and without, Chapin on, 82
 Ptomaines, 175, discovered by Brieger, 176
 "PUBLIC HEALTH" why enlarged, 1
 Public Health, A Country Cousin's Views on, F. J. Burman, 128
 Future needs, Board and Minister of Public Health, 129
 Compulsory Notification of Phthisis, 129
 Free Supply of Spittoons, 129
 Security of Tenure, 129
 Smoke consumption regulation, 129
 Housing Improvement, 128
 Isolation Hospitals, 128
 Midwives' Act, 128-9
 Public Health Administration: —
 Function in, of the Doctor, Editorial, 89
 Authorities, action of, as to Sanatoria for poor Consumptives, 231, 232
 Early aims of Sanitarians, and widened scope of Public Health, 89
 Public Health Department, Development of a, E. H. Snell, 283, Editorial note, *ib.*
 Public Health provisions, New Elementary Education Code, 240 *et seq.*
 Public Schools, see under Schools
 Puerperal Fever, Cases classed as, London, 1906, with deaths, 30
 Manchester definition of, 20
 Pulmonary diseases as cause of Infant Mortality, Calcutta and England, 147
 Tuberculosis, see under Tuberculosis
 Pupil Teachers, see under Teachers
 Purification of Sewage on Slate Beds, W. J. Dibdin, 228, 230, discussion, 230
 Pus, Disinfection of, experiments on, of Hewlett and Kenwood, 5
 QUEEN Victoria's Jubilee Institute for Nurses, policy of as to County Nursing Associations, two types of nurse recognized by, 167
 RAILWAY Companies and Milk Traffic, Yorkshire Report, 266
 Ransome, Dr., experiments of, with others, on effects of Light and Air on Tuberculous Sputum, 56
 views of, on "simple contagion" in Phthisis, 104-5
 Rates, Housing, Wages, in Rural Districts relations between, 139, 143
 Rating in Derbyshire involved by Isolation Hospitals, Barwise on, 70
 Rations in Hospitals — unwisdom of — Herbert Jones on, 71
 Rats, The War on, A. E. Moore, letter, 251
 Raw Materials, Preservatives in, 236
 Reading, Brain centre governing power to learn, 90, 94
 methods of teaching, 94
 Recent Discussion, The, on Disinfection, letters, C. V. Chapin, 82-3, C. T. Kingzett, 83

- Recent Public Health Literature: 49, 87, 133, 172, 211, 292
- Referring of Deaths to Districts, letters, J. H. Garrett, 169, H. C. Kidd, 209
- Register of Children Medically Inspected, Richards on, 31
- Registrar-General, Quarterly return of, Jan., 1908, The Chief Vital Statistics for the Year 1907 from, (table), 42
- Registration of Midwives, 167
- Regulations for Training of Teachers for Elementary Schools, in Hygiene & Physical Exercises, 422
- Re-housing operations in Liverpool, Notes on some of the Results of, E. W. Hope, (tables), 62, 67, discussion 66
- Acts under which carried out, 62
- Compensation, advantages of, 62
- Cost, anticipated, 62, actual, 63
- Dwellings owned by Corporation number of 63
- rents, 63
- selection of Tenants 63, 64
- sickness and mortality rates in, 64, tables 65-6
- statistics concerning, (tables) 64-65
- Further schemes, 63
- Licensed property as affected by, 63
- Tenants, would-be, Statistics concerning, 64
- Reid, G., President, I.S.M.O.H., illness of and recovery, 44, 206
- on School Hygiene as a means of combating Infant Mortality, and on the aid of Midwives, &c., 43
- Reigate, R. D., Epidemic of Contagious Impetigo in Schools in, A. G. Porter, 34
- Removal of Clothing of School Children for Medical Inspection purposes, Richards on, 32, 33
- Rents for Cottages at Chipperfield, 139
- of Liverpool Corporation Dwellings 63, lowness of, Butler on, 66
- in relation to Wages, Hamburg, 121
- in relation to Wages and rates, in Rural Districts, 139, 143
- Reports
- Bulstrode's on "Sanatoria for Consumptives" Editorial on, 51, Niven on, 52 *et seq.*, 101 *et seq.*
- Yorkshire Milk, J. S. Cameron, 263, Editorial on, 255
- Reservoirs, sites, construction, protection, 257
- Resignation of Sir Henry Littlejohn, 67
- Rest for Diphtheria Patients, McLean on, 273
- Retailer of Milk, hints to, Yorkshire Report, 266
- Return Cases of Scarlet Fever, *see* discussion, pp. 150-1
- Cameron cited on, 73
- Goodall cited on, 74
- Hospital and external influences affecting, 149
- relation between, and long detention in Hospital, 149
- Reviews:
- Alden's (Margaret), *Child Life and Labour*, 203
- Bardswell & Chapman's *Diets in Tuberculosis*, 247
- Jenner-Fust's (arranged & annotated by) *Poor Law Orders*, 36

Reviews (continued)

- Jensen's *Cast-Iron House Drainage*, 248
- Kenwood's *Public Health Laboratory Work*, 248
- Lyster's *School Hygiene*, 36
- Neisser's *Internationale Uebersicht ueber Geuerbehygiene nach der Berichten der Geuerbe-Inspektionen der Kulturlaender*, 81
- Nettlefold's *Practical Housing*, 130
- Nuttall & Graham-Smith's (editors) *Bacteriology of Diphtheria*, 203
- Pattin's *Runnunge*, 81
- Public Health Act, 1875 & other Statutes relating to Public Health. (Index by Davey) 248
- Robertson's *Meat and Food Inspection*, 130
- Thompson's *Housing Up-to-Date*, 36
- Whitelegge & Newman's *Hygiene and Public Health*, 203
- Rheumatism, in Childhood, Thomas on, 193
- Richards, H. M., Control of Ringworm in School Children (Croydon), 274
- Methods and Aims, The, of the Medical Inspection of School Children, 31
- in discussion on Hope's paper on Liverpool Re-housing, 67
- on Isolation Hospital Accounts, dietary system condemned by, 71
- Rideal, S., and others, on Disinfection, and on the Rideal-Walker test, 11, 12
- Ridge, Dr. J. J., obituary notice of, 205
- Right-handed people, and the function of Speech, Broca's discovery, 90
- Ringworm in School Children, Control of, Croydon, H. M. Richards, 274
- Duration of, causes affecting, 275
- Health visitors' duties *re*, 274, 276
- Notification of, 274
- Number of cases under Public Health Dept. 1907., 274
- Possibility of Stamping-out, 276
- Procedure adopted, 274 *et seq.*
- Relapses in, 275
- Treatment
- Drug, indications for, 275, time taken to cure by, 275-6
- Home and Town Hall, 274-5, results compared, 276
- X-ray, indications for, 275, time taken to cure, 275-6
- Favus, defined, treatment of, 276
- River Water Supplies and Filtered Waters, A. E. Thomas, (tables), 257
- Bacteriology as applied to, 259-61
- Chemical Examination, 257, 259
- Epidemiology in relation to, 262
- Filter Beds, composition, working, cleansing, 261-2, 263
- defects in, consequences, 262
- storage as adjunct to, 262
- Storage, 262, 263
- Topography, 257
- River Banks and Course, Inspection of, 257-9
- Reservoirs, site, construction, protection, 257
- Safety of Water-Supply, on what dependent, 263
- Rivers, as Water-supply, inspection of course and banks, 257-9

- Robinson, A., The Trained Midwife and her effect on Infantile Mortality, (tables), 22
- Room, or Clothing, Disinfection of, Firth's views, 11, other views, 11 *et seq.*
- Rotherham, Early Notification in, of Births, results, Robinson on, 23 *et seq.*
- Prizes of the Mayoress for Midwives, 27
- Report of the Lady Health Visitor for 1906., 25, (tables), 26
- Roumania, Medical Inspection of School Children in, 189
- Rowntree, B. S., evidence of, on Security of Tenure, 158
- Royal Commission on Labour, views of, on Security of Tenure, 158
- Royal Commissions, etc., Recommendations of, in favour of Non-lapsing Appointments of Sanitary Officers, 151 *et seq.*
- Royal Sanitary Commission, views of, on Security of Tenure, 158
- Rural Housing, *see also* Garden City, Rural Housing, and the Government
- SACRAMENTAL Cups, separate, Medical Officer's plea for D. J. Morgan (letter), 170
- Sadler, F. J., on Desquamation, &c., and Infectivity in Scarlet Fever, 150
- on methods in vogue at Kendray Hospital, Barnsley, in reference to Scarlet Fever, 151
- St. Helens, investigations at, into incidence of Pulmonary Tuberculosis (tables), Buchanan, 152-4
- St. Pancras, efforts in, to combat Infant Mortality, 43
- St. Vitus' Dance, A case of. A Copy-book Study (Tasmania), J. S. C. Elkington, (ill.), 277
- duration, 279
- Heart-disease as sequel to, 279
- symptoms, 279
- Salar(y)ies of Part-time M. O. H. (Brixworth R.D.C.), Editorial, 256
- School Hygiene Officials, Boston, U.S.A., 282
- Sanatoria for Consumptives, Bulstrode's Report on, Editorial on, 51, Niven on, 52 *et seq.*, 101 *et seq.*
- Dudfield on, 280 *et seq.*
- Sanatoria and Sanitation, relative value of, in checking Tuberculosis, 155
- Sanitary administration in London in 1887 *circa*, Davies on, 114
- Authorities, recalcitrance of, 136
- Inspectors, the L.G.B. and the County Councils, Fremantle on, 145
- Officials, chief support of, 141
- Security of Tenure for various enactments *re*, 156, views adverse to, 156, 157, views in favour of, 157 *et seq.*
- Reform, dependent on reform of authority and officers (Fremantle), 144
- Survey, a desideratum, Fremantle on, 144
- Sanitation in relation to diminished Phthisis death-rate, 106-7
- in relation to efficiency, Simon cited on, 220

- Sausage-poisoning, bacillus causing, 175
- Sausages, Preservatives in, 239
- Scarlet Fever, Death-rate from, London, table, 116, diminution of, 114, 117
- Desquamation in, Infectivity of, S. G. H. Moore, 148, 151, discussion, 150-1
- Disinfection for, by Fumigation and by Spraying, results, Kenwood on, (table), 9
- Hospital Isolation for, H. B. Collins (letter)
- Millard's views cited, 72
- results compared with Home Isolation, Malet cited on, 72
- Infectivity of, commencement and duration of, 148
- Methods of treatment, Kendray Hospital, Barnsley, Sadler on, 151
- Nose and Ear as sources of long persisting Infection, 148
- Notification and Isolation in Hospital, Davies on, 118
- Scatterty, W., on Desquamation and Infectivity in Scarlet Fever, 151
- Schedule, The Official, of Medical Inspection, Editorial, 1, & *see* 32, 37
- Scholarships for Midwives, London, 31
- School Books, Disinfection of (for Impetigo) Porter's methods, 36
- School Children, Absentee, Manchester, 165
- Deafness and Mental Deficiency in, at Breslau, (Kobrak), 188
- on Duties of M.O.H., 230
- Exclusion of, from School (new code), 241
- Meals for, provision of, Manchester, 165
- regulations on, of New Code, 240
- Medical Examination, or Medical Inspection of, *see those heads*
- Medical Treatment of, Centres for, in Populous Districts: School Clinics or, A. H. Hogarth, 194
- with Ringworm, how dealt with at Croydon, 274 *et seq.*
- Teeth of, 78, 166-7
- School Clinics: or Centres for Medical Treatment of School Children in Populous Districts, A. H. Hogarth, 194
- Dental, Germany, C. E. Wallis, 78
- Dentist, the, The Work of, Oliver, Keen, and Elliott on, 201, 202
- Disinfection after Epidemic of Impetigo, Porter's methods, 36
- School Doctor, the, Position of in I.S.M.O.H., Editorial, 173
- School Doctors in Germany, 195
- Examinations by, First, 195
- Re-examination, 196
- Results, 197
- Time occupied by, 198
- Health Certificates of, 196
- Health Lectures for Teachers, 198
- Payment of—question of Cost of Work as whole, 199
- Position of, 202
- Progress of the movement, 199, 200
- Treatment of Defectives, 197-8

- School Hygiene as a means of (eventually) combating Infant Mortality, Reid cited on, 43, work in, of Staffs, C.C., 44
- Breslau, 1906-7 (tables), 155
- department of, Boston, officials, duties and salaries of, 280-2
- Development of (Editorial), 1
- in America, 279-80
- Disinfection and Cleansing of School Premises, and School Books, 8
- in Manchester, 163
- Bathing of School Children, 163
- Country School, 163
- Feeding and Tending of Infants, teaching of, 163
- Housewifery cottage centre, 163
- Medical Inspection, 165
- Physical Exercises, teaching of, 163
- Scope of, 89
- in Tasmania, 3
- Training in, of Elementary School Teachers, 242 & *see* 217
- School Influence on Diphtheria, W. Australia, Cumpston on, 184
- Inspection, *see* Medical Inspection
- School(s), *see also* Elementary Education Code, L.C.C. Special Schools, &c.
- French, Overpressure in (Mathieu), 78
- for Mothers, St. Pancras, work of, 43
- Public, Boston, U.S.A., Medical Inspection in, T. F. Harrington, (table), 279
- Sanitation of, in relation to diminution in Phthisis Death-rate, 107
- visited by those attending Lectures, &c., on Medical Inspection of School Children, 186 *et seq.*
- Schools and Hospitals, relations between, in regard to Medical Inspection of School Children, Richards on, 34-5
- Scotland, *see also* Dundee, Edinburgh, Glasgow, Paisley
- Compulsory Notification of Phthisis in, approved by L.G.B., 235
- towns adopting, 235
- Housing in, improvement in, in forty years, 220
- Scottish Burghs (certain) nationality of population in, 1861-1901, table, 225-6
- Seasons, influence of, on Diphtheria, W. Australia, 183
- Seaton, E. C., on Isolation Hospital Expenses, 71
- Security of Tenure for M.O.H., Burman on, 129, 147
- Fremantle on, 141-2
- Jones, (Herbert) on, 156 *et seq.*
- Present Position of the M.O.H., Editorial, 136
- Security of Tenure for Sanitary Officials, 156, 157 *et seq.*
- Sediment in Milk, Orr's remarks on, 268
- Segregation in Phthisis, to limit Infection (Bulstrode), 103
- Separate Rooms *versus* Wards, in Isolation Hospitals, Corbin on, 74
- Hospitals using, 74 *et seq.*
- Sergeant, E., on Medical Inspection of School Children, 46
- on Town Planning, 227
- Serum diagnosis, a point to note, 177
- Sexual influences (*see also* Husband and Wife), as affecting occurrence of Tubercular Disease, Niven on, 58
- Sewage Effluent, organisms in, 258
- Purification of on Slate Beds, W. J. Dibdin, 228, 230, discussion 230
- Simon, Sir J., cited on Sanitary State of London poor, 220
- Simpson, Prof., view of, on long detention in Hospital in relation to Scarlet Fever Infectivity, 149
- Sites, over-crowding on, Rural as well as Urban, 140
- Skin conditions, in various diseases, relative Infectivity resulting, Moore on, 148
- diseases (*see also* Ringworm), Manchester Schools, 165
- Slate Beds, Purification on, of Sewage, W. J. Dibdin, 228, 230, discussion, 230
- Sleeping accommodation, scant, in rural Cottages, 139, 140
- Slum properties, and slum populations, reforms of, 223
- Smith, Margaret M., Some Observations on an Inquiry into Still-births occurring in Manchester since 1905., (tables), 15
- P. C., on relative Mortality in Large and Cottage Municipal Dwellings, 66
- Smoke Consumption, regulations to enforce needed, Burman, 129
- Snell, E. H., The Development of a Health Department, (Coven-try), 283, Editorial note, *ib.*
- Soap and Water, in Disinfection, Kenwood on, 8, 10, view endorsed by Firth, 11, Rideal's view, 11
- Social Economy, The Utility of the German "Freibank" System as a factor in, E. Kaut-thack, (tables), 119
- Speech, aberrations of, *see* Echolalia Idioglissa, and Paragaphia
- causes of, 92 *et seq.*
- age at which first understood, 90, 91
- age at which first uttered, 91
- gradual discovery of Brain functions connected with, Thomas, 90
- Sommerville, Dr., on Disinfection and Standardization of Disinfectants, 13
- Southern Hospital, The, as Sanatorium, Dudfield's suggestion, 233-4 & note
- South-Western Hospital, Metropolitan Asylums Board, Semi-separate cubicles for different Infectious Diseases at, 76
- Southampton, Desquamation of Scarlet Fever disregarded at, results, 149
- Spitting, spread of Phthisis by, 53, 102
- prevention of, Burman on, 12
- Spontaneous occurrence of Tuberculosis in Guinea-pigs and Rabbits, Koch's experience, 55, 59
- Spray and Fumigation Disinfection, pros and cons of, and table of results in Scarlet Fever and Diphtheria, Kenwood, 9, 10

- Spread of Disease—restricted by removal of infected persons to Hospital *an axiom*, Corbin, 72
- Sputum, *see under* Tubercular Infection
- Staff of Isolation Hospitals—maintenance cost—Barwise on, 69-70
- Staffordshire, *see* Wolverhampton
- County Council efforts of, to combat Infant Mortality, the unteachable Mother, Reid on, 43-4
- Stammerers, among Manchester School-children, 166
- Standard of School Children and Regularity of Attendance in relation to Physical or Mental defects, Richards on, 33
- Standardization of Disinfectants, J. T. Ainslie Walker, *letter* (table), 48
- Bacteriological, requirements of Office of Works, 4
- Scheme for, of Lister Institute, 6
- Starch in Potted Meats, Macfadden on, 239
- Statistics of Infant Mortality for Bristol and Huddersfield, D. S. Davies, (tables & charts), 40
- Vital, The Chief, for the year 1907, from Quarterly Return of Registrar-General, Jan., 1908 (table), 42
- Stevenson, Sir Thomas, obituary notice, 284
- Still-births, high incidence of, Calcutta, 147
- notified, London, 1906, with details, 29
- occurring in Manchester since 1905, Some Observations on an Inquiry into, Margaret M. Smith, (tables), 15
- Deaths of Infants under 3, and under 12 months, causes, (table), 19
- Development of the Fetus, 19
- Fetal life, losses of, 15
- Causes, 19 *et seq.*
- Remedies, existing and required, 21, 22
- Total, 18, 19
- Maternal occupation in relation to, and to total and average number of live children, and miscarriages, 17, 18, tables, 18
- Occurring in St. Mary's Hospital, 1905-6, numbers and classification of, as to sex, age, and presentation, 17
- Occurring in the Practice of Midwives 1905-7—sex distribution and fetal age, 16
- Puerperal morbidity, 20
- Returns of, for 1906, 15, table, 16
- Total Loss of Fetal Life in Manchester, and Ancoats, 18, 19
- Still days, better results on, with Formaldehyde Disinfection than on Windy days, Firth on, 11
- Sterilized, diseased or deteriorated Meat as sold in Germany, how prepared and classified, 119 *et seq.*
- Stoddart, Mrs. C. J. (Mayoress of Rotherham)—Prizes given by, to Midwives—regulations for, 27—Supply of Milk, &c., by, for lying in women, 25
- W., on Sewage Purification on Slate Beds, 230
- Storage of Water Supplies, 262, 263
- Strasburg School Dental Clinics at, 78, how worked as to children, and parents, 79, and during holidays, 80
- Stratford, Conviction at, re exposure for sale of Tubercular Beef, 88
- Streptococci in Milk, Orr's findings, 270
- Structural Expenses, Isolation Hospitals, Barwise on, 68 *et seq.*
- Sub-infectious, term objected to, by Niven as applied to Tubercular Phthisis, 53
- Suffocation, warning re, in Diphtheria, 272
- Sulphites, in Meat Preservation, Macfadden on, 239
- Sulphurous Acid, use of, in ridding an old Empty House of Fleas, Kenwood on, 7, 8
- Suppurative Skin conditions, Infectivity of, 148
- Surrey, *see* Croydon, & Reigate
- Swansea, plea of M.O.H. of, for separate Cups in the Lord's Supper, D. J. Morgan, *letter*, 170
- Sweden, Medical Inspection of School Children in, 189
- Swimming, teaching of, Manchester Schools, 163
- Switzerland, *see* Fluntern
- Medical Inspection of School Children in, 189
- Midwives organisation, &c. in, 23
- Symons, W. H., on Food-storage in Municipal Dwellings, 66
- Syphilis, as affecting Still-births or early deaths of Infants, 20
- TAHITI, ravages of Phthisis in, 53
- Talent, Dr., on Medical Inspection of School Children, 47
- Tasmania, Case in, of St. Vitus' Dance J. S. C. Elkington, (ill.), 277
- School Hygiene in, 3
- Tattersall, C., on Medical Inspection of School Children—New York Methods, &c., 45
- Tavistock Place Cripple School, and other L.C.C. centres, 187
- Teachers, Elementary
- Lectures to, on Hygiene, Manchester, 163
- relations of, with School Doctors, Thomas on, 193
- Rôle of, in Medical Inspection, 31-2, 34
- Training of, in Hygiene and Physical Exercises, Regulations for, 242
- in Physical Exercises, Manchester, 163
- German
- Health Lectures to, 198
- Instruction of, in Dental Hygiene, 79
- Pupil, Lectures to, on Hygiene, 166
- Teeth of School Children, Germany and England, 78
- at Manchester, 166-7
- Temperature and Disinfectants, 7
- and Milk, 266-7, 270
- Templeman, C., trip of, to Washington, Dundee Town Council and, 245
- Templeman, on Town Planning, 227
- Tenants, desiring accommodation of Liverpool Corporation, 64
- Tenement-houses, in and near Glasgow, 227
- lofty, drawbacks to, Chalmer's on, 224, others on, 227
- Tent-dwellers, immunity of, from Phthisis, 53
- Tetanus, as cause of Infant Mortality in Calcutta, 147
- Tests for Soundness of Meat, 171-9
- Thomas, A. E., River Water Supplies, and Filtered Waters, (table), 257
- on Medical Inspection of School Children, 47
- on Personal Infection in Tuberculosis, 155
- C. J., The Aphasias of Childhood and Educational Hygiene, (diags), 90
- The History and Practice of Medical School Inspection, 189
- T., on Purification of Sewage on Slate Beds, 230
- Thought, silent, as affected by the Auditory Word Centre, Thomas, 91
- Throat, Bacteria inclined to linger in, 48
- Tidal flow, influence of, on River Water, 258
- Tinned Fruits, Unwholesome, summons re, 184
- Tissue proclivity in relation to Tubercular Infection, Niven on, 58
- Tooth-cleaning, Bostall Woods Open-air School, 80
- German method of inculcating, 80
- Topography in relation to River Water Supplies, 257
- Town and Country Milk, Orr's experiments on, 267-9
- Town life v. country, Physical results, 221
- Town Planning, *see also* Garden Cities
- Aggregation tendency, question of checking, 223
- Existing Legislation, some defects in, and imperfect use of, 222-3
- Growth of Cities in relation to, A. K. Chalmers (tables), 218, discussion, 227
- Housing and Town Planning Bill, aims of, 218 *et seq.*
- Necessity of, over Large Areas, 226
- Past Experience, 219
- Town Populations, Stability in Structure of, Evidence of Increasing, 224, & table 225-6
- Toxins, two classes, 176
- Tracheotomy in Diphtheria, with Antitoxin, 272
- Trained Midwife, The, and her effect on Infantile Mortality, A. Robinson, (tables), 22
- Midwives Act (1902), advantages of, as seen in Rotherham, 22 *et seq.*
- Training, *see* Teachers
- Treatment of Diphtheria, C. J. R. McLean, 274
- Trotter, Dr., on Desquamation in relation to Infectivity of Scarlet Fever, 150
- Tubercle Bacilli, Human or Bovine, effect of, when fed to Calves, Niven on, 59
- Tubercular Beef—conviction re exposure of, for sale, Stratford, 88
- Tubercular Infection
- Age in relation to, 57-8
- Sputum in relation to, dried, in Dust, 53-7
- moist in Cough-expelled particles, 53-7

- Tuberculin Ophthalmic Reaction, *see* Calmette's
- Tuberculosis
- in Children and Man, possible Bovine sources of, 57, 58, 59
- death rate from, 1906, London, 233
- Early Diagnosis of, Calmette's Tuberculin Ophthalmic Reaction as a Help in, H. C. Lecky, (tables), 60
- Fight against, Prevention of Consumption and, T. O. Duffield, 230
- Heredity in relation to, 58
- Latent at Birth, Niven, on, 58
- Infection, Wheatley & others on, 155
- Mortality in Prussian Catholic Nursing Orders, Cornet's inferences criticized, 101
- Primary Abdominal and Thoracic in Bovine animals, relative frequency of, King's examinations, table, 59
- Pulmonary, Etiological differences of, view on 51
- Personal Infection in, J. J. Buchanan, tables, 152, 155; discussion, 155
- Contributing causes, 154-5
- Dose of Infection and repetition, in regard to views of Newsholme and of Niven, 152
- Hereditary Predisposition in regard to, 152, 155
- House and Household infection, 153, 154
- "Infectious" vague limitation of term, 152
- Infectivity of, divergent views on, 152
- Lodgers and Infection, 154
- St. Helens' cases, 152-4
- Question, Bulstrode's report on Sanatoria for Consumptives and on Certain aspects of, Editorial on, 51, Niven on, 52 *et seq.*, 101 *et seq.*
- Spontaneous, in Guinea-pigs and Rabbits, Koch's experience, 55, 59
- Tuberculous Cow, prosecution and conviction re, Leeds, 67
- Twenty Years' Metropolitan Advance in Preventive Medicine, S. Davies, (tables), 114
- Death-rate diminution during, diseases chiefly affected, discussed *en bloc*, 114, *en detail*, 115 *et seq.*
- Health visitors, need for 118
- Hospital Isolation, 117-8
- Medical profession, privilege of, 118
- Methods, past, and future of combating disease, 118
- Sanitary administration twenty years back, 114
- Typhoid Fever, *see also* Enteric
- Mistaken cases of, 177
- Mortality of, relative to that of Paratyphoid, 178
- Mortality in W. Australia, 182
- Outbreaks of, Two, in Massachusetts, 2
- Typhus patients in general Hospitals—risks from, to other sufferers, 72-3
- UNDERGROUND Bakehouse, at Hotel, Summons, re, 193
- niforms, military, as disinfected at Aldershot, Firth on, 11
- nited States of America, *see* America, U.S.
- nwholesome Tinned Fruits, summons re, 184
- VAN ERMINGEN, discoverer of *B. botulinus*, 175, 176
- Vapourising in Disinfection, difficulties in, Davies on, 13
- Ventilation in L.C.C. Schools, 186, 187
- Sash-windows best in country Cottages, 140, 143
- unnoticeableness of, essential in Cottages, 143
- Victoria, Australia, Regulations in, re labelling of packages of Disinfectants or Germicides, 4
- Villemin cited on incidence of Phthisis in relation to altitude, closeness of population, new races, 52, 53, 58
- Visual Speech Centre, function of, 90
- Visuals, strong and weak, 92
- rapid reading by the former, 94
- Vital Statistics for the year 1907, The Chief, from the Quarterly Return of Registrar-General, January, 1908, (table), 42
- Vomiting in Diphtheria, 273, 274
- Von Behring's view on cause of Tuberculosis, 57
- Voss, Mrs. G. de, *see* Kanthack, Emilia
- WAGES, certain counties, 143
- allowances in kind supplementing, 143
- small-holdings and allotments in relation to, 144
- in relation to Rent, Hamburg, 121
- Rent, Rates, relations between in Rural Districts, 139, 143
- Wales, *see* Bangor, England and Wales, & Swansea
- Wales, H.R.H. the Prince of, on Sanatoria for Workers suffering from Tuberculosis, 231, 233
- Walker, J. T. Ainslie, The Standardization of Disinfectants, *letter*, (table), 48
- Wallis, C. E., The School Dental Clinics of Germany, 78
- Walthamstow, U.D.C. Isolation Hospital, separate cubicles at, for different Infectious diseases, 74-6
- Walworth, bad state of School Children's teeth in, 78
- Wards versus Single Rooms in Isolation Hospitals, 74
- Warwickshire, *see* Birmingham, and Coventry
- War on Rats, A. E. Moore, *letter*, 251
- London, 197
- Water, Dirty, in Milk, conviction re, 239
- Water Supplies, River, and, A. E. Waters, 257, *subh.*
- Waters, A. E., *see* above
- Waylen, G. S. A., on Slate Beds, Purification of Sewage, 230
- Weighing Machines, Medical Inspection of School Children, 33
- Wernicke's discovery of the Brain centre for understanding Spoken Language, 90
- West Australia, History of Diphtheria in, H. Cumpston, *charts & tables*, 180
- West Ham, Conviction at, for sale of incorrectly designated Milk, 239
- Westminster, conviction at, for Sale of Adulterated Cream, 247
- summons in, re Underground Bakehouse of Hotel, 193
- West Riding, Insanitary Rural Cottages in, 140
- Wheatley, J., on Bulstrode's report, and on Tuberculosis Infection, 155
- Wheeldon, Dr., on Medical Inspection of School Children, 47
- Whickham U.D.C., and the power of a District Council to appoint Health Visitors, 284
- Whooping-cough, Death-rate from, 116, rapid diminution of, Davies on, 115, 116
- Window-area, common inadequacy of, in Cottages, 139, 140
- Winterslow, local building material as employed at, 144
- Wilson, Dr., on Town Planning, 227
- M., initiator of Yorkshire Milk Inquiry, 263, 264
- Wiltshire, *see* Devizes
- Wolverhampton, comparative results at, of Home, and of Hospital Isolation for Scarlet Fever, Malet cited on, 72
- Woodforde, W. T. G. (the late), Memorandum prepared by, upon the Public Health Bill, 1872., as regards Security of Tenure, 160
- Obituary notice, A. Ashby, 135
- Woolwich, Measles mortality in, 116, diminution of, 117
- Borough Council, Sanatorium Treatment for Phthisis provided by, good results, 115
- Voluntary Notification of Diarrhoea at, Davies on, 118
- Word-blindness, defined, 95
- acquired, cases of, 95
- congenital, cases of, 96 *et seq.*
- treatment, 98
- Word-deafness, congenital, in Children, cases of 92-3
- Words, heard, and seen, Brain centres for understanding, discoverers of, 90
- Workers' (Consumption) Sanatorium Beneden, Duffield on, 231
- Working Classes, Housing of, *see also* Housing
- improvement in, originators of, 138
- Workmen's Compensation Act, claim under, of M.O.H.'s widow, 245
- Works, H. M. Office of, requirements of, re Standardization of Disinfectants, 4
- Worms, City of, Medical Inspection in, of School Children, table, 113
- Wren, Sir C., plans of, for rebuilding of Ringworm, Filiculations for, 275, time taken to cure by, 275-6
- YORKSHIRE Milk, *see* Barnsley, Bilston, Halifax, Huddersfield, Leeds, & Rotherham
- Yorkshire Milk, report on, J. S. Camm on, 263, Editorial on, 255
- how originated, 263
- how prosecuted, 264
- results, 265 *et seq.*
- suggestions and conclusions, 270
- Young, K., sketch plans furnished by, of new ward block for London Fever Hospital, with separate cubicles, 76
- plans, 77
- ZYMOTIC diseases, reduced Death rates from, Davies on, 114 *et seq.*