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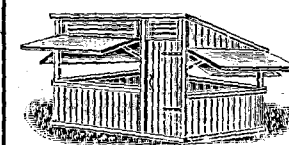
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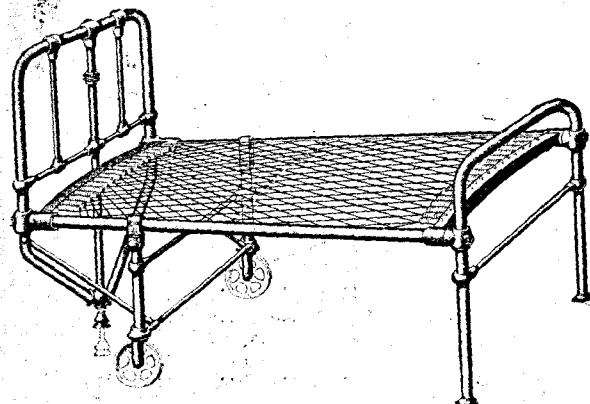
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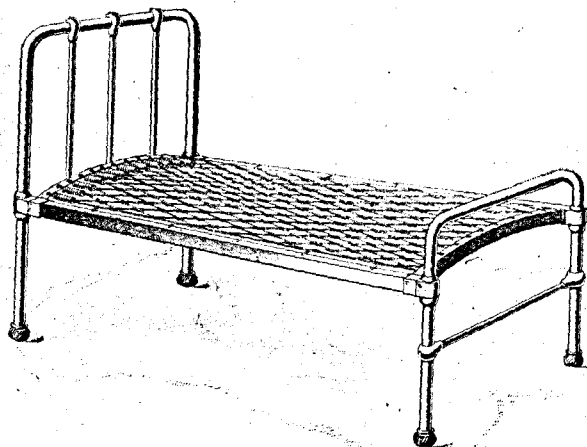
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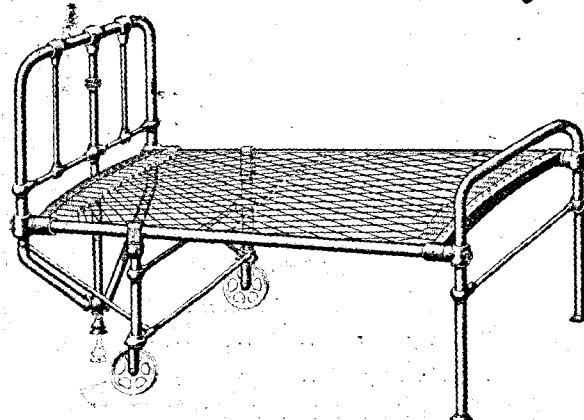
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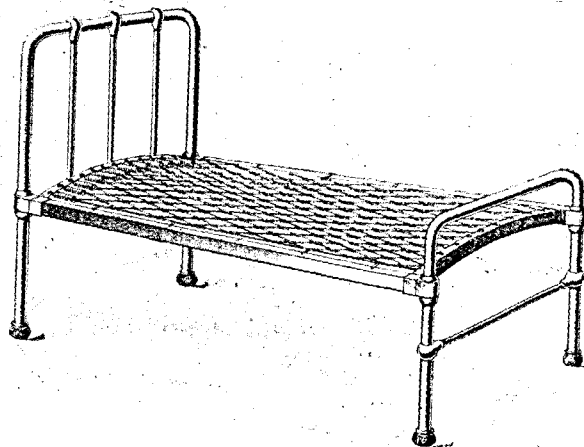
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Public Health

THE JOURNAL OF

The Society of Medical Officers of Health.

No. 1.

OCTOBER, 1912.

VOL. XXVI.

INSURANCE ACT: SANATORIUM BENEFIT.

IN our issue of August last we discussed in general terms the question of the relationship between the "chief tuberculous officer" of the Astor Report and the medical officer of health. On this occasion we propose to consider, in the briefest possible way, two other questions relating to the administration of sanatorium benefit. The first is the scope and method of a 'dispensary,' a subject which we are induced to take up because, judging by what has been printed and said about dispensaries, we have come to the conclusion that there is some uncertainty as to their proper activities.

The work of a dispensary is outlined in the Astor Report in the following terms:—"18. In a general way, the function of the tuberculosis dispensary should be to serve as:—

- (1) Receiving house and centre of diagnosis.
- (2) Clearing house and centre of observation.
- (3) Centre for curative treatment.
- (4) Centre for the examination of 'contacts.'
- (5) Centre for 'after care.'
- (6) Information bureau and educational centre."

The first five of the above are and have been included in the programme of every dispensary modelled on the original dispensary, viz., the Royal Victoria Dispensary in Edinburgh. How those duties are regarded and carried out may be seen from the following quotation from the last report of the dispensary established in Paddington.

"Our objects can be briefly summarised as comprising the care of the tuberculous, such care including in addition to medical treatment, the amelioration of the sufferers' homes and daily life—to promote recovery, to put the patients in the way of being useful citizens, and to prevent them from relapsing into ill health. Another object—in importance ranking perhaps even before those already mentioned—is the discovery of unrecognised cases of the disease. As regards such,

the Dispensary seeks to secure the treatment of their disease at the earliest date possible—when the prospect of arrest and recovery is most hopeful—and by bringing the patients under supervision to obviate all danger of the spread of the disease from unlooked-for centres of infection.

The methods employed to secure such objects include among others:—

- (a) The examination and treatment of patients.
- (b) The examination of relatives and others living or associating with patients.
- (c) The investigation of home conditions, with the remedying as far as possible, of all conditions inimical to health or prejudicial to the patients' recovery.
- (d) The removal to sanatorium, hospital or other institution, of patients requiring special treatment; and
- (e) The after-care of patients discharged from institutions."

The activities indicated in such a programme naturally fall under three heads, viz.:—(a) clinical, (b) preventive, and (c) administrative. As to the first—the clinical—it appears to us that any attempt to limit the "consulting officer" (for that is the title used by the Local Government Board in the Order of July 26th last) to diagnosis alone is to impose a limitation on the work of the dispensary, which is contrary to the recommendation of the Astor Committee and likely to seriously prejudice the usefulness of the institution. At the same time we think it would be well to lay down a general rule that treatment should be confined to patients able to attend at the dispensary, the dispensary staff only giving treatment at home in emergencies.

The preventive function is really the duty of the local authority, and when it forms part of the work of the staff of a dispensary, it should be done as on behalf of the local authority, to whose representative all results of the work should be communicated systematically and promptly. This consideration leads naturally to the second question which

we propose for consideration, viz., the relationship of the medical officer of health to the dispensary.

The authority for the administration of sanatorium benefit, being the insurance committee of the county or county borough, there has been a tendency to assume that the whole of the general scheme for dealing with tuberculosis which the Astor Committee advise should be inaugurated, will be administered by the medical officers of health of counties and county boroughs, to the exclusion from all participation by the officers of urban and rural districts. Such assumption appears to us to be unfounded. It is true that the Astor Committee recommend that the county and county borough councils should be primarily responsible for the work, but it has to be remembered that county (other than county borough) councils are not local health authorities, and except in certain specified matters have no executive sanitary functions. It will doubtless be found that the provision of sanatorium and hospital accommodation can be most advantageously undertaken by such councils, but it appears to us that the authorities who will have to provide and maintain dispensaries will be the local sanitary, viz., the councils of county boroughs, urban and rural districts—they being the authorities to whom (speaking quite generally) powers, to provide hospital accommodation are entrusted. It was owing to the possession of such powers that the Local Government Board decided a short time back that dispensaries could be established by local sanitary authorities. Wherever, therefore, a dispensary is established the local medical officer of health will retain his supervision over the tuberculous. That the establishment of such institutions is likely to become general may be anticipated as soon as effect is given to the promise of the Government to contribute half the cost to local authorities, of the treatment in institutions (which term includes dispensaries) of tuberculous persons other than insured. Ultimately a local authority maintaining an approved dispensary will secure re-imbursements from the Insurance Committee of the county (for the tuberculous insured persons) and from the Local Government Board (for all others).

The opinion of the Society on the question of the relationship of the medical officer of health to the dispensary and its staff can be summed up somewhat as follows:—That where a dispensary is established the

medical officer of health should be responsible for all administration and work other than diagnosis and clinical treatment, and that the work of the "consulting officer" should, except as regards diagnosis and treatment, be subject to a general supervision by the medical officer of health. We fail to see how proper co-ordination of the work and efficient administration can be secured otherwise.

We have endeavoured in the above paragraphs to indicate what appear to us to be the true functions of a dispensary and how its activities should be correlated and linked up with the work of the medical officer of health. We are quite conscious that we have left untouched several very difficult parts of the subject, such as the case of a dispensary having to serve two or more small districts, or that of a dispensary maintained on a voluntary system. Such cases must be left to be settled on lines suitable to each individual case—the broad principles will remain unaltered.

DEFECTIVE SCHOOL CHILDREN.—At the recent meeting of the British Association, a committee, of which Professor J. J. Findlay was chairman, submitted a report on the methods and results of research touching the mental and physical factors of education. With reference to the mentally or otherwise defective children the report observes:—"It is insufficient to prove that the child is unfit for normal instruction. We have further to determine whether his state admits of any remedy. Often it is more or less due to imperfect nutrition, adenoids, abnormalities of the ductless glands, nervous diseases, and so on, which may admit of considerable betterment. Here we have an excellent reason why the final verdict on the child, in these cases at least, should rest with the school medical officer."

THE MAKING OF SLUMS.—That house-owners or house-farmers are not always to blame for the evil condition of so-called slums is fairly evidenced by a recent report of the medical officer of health of Lambeth on a petition addressed to the borough council anent the condition of Waxwell Street. After stating that the property was under frequent inspection, the medical officer of health proceeds to call attention to the habits of the occupiers of the property as the true foundation for the complaint. At one house where an additional supply of water was required, grave nuisance has arisen "owing to the dirty and slovenly habits of the tenants. . . . What is really required is to alter the habits of the particular people to whom the houses have been let." He was unable to advise the council to make any closing orders.

CONTROL OF RINGWORM IN SCHOOL.*

ADAM, M.A., M.D., M.R.C.S., D.P.H.,
County Medical Officer of Health, Stirlingshire, late
Assistant County Medical Officer of Health, West
Riding of Yorkshire.

OR some years the prevalence of ringworm of the head has interfered in a marked degree with Elementary Education in the West Riding. The medical department was not heedless of the ravages of the disease. Efforts were made to see if it could be stamped out, and certain schools, wherein the disease as more prevalent, were selected for special observation by the Central Medical Staff. The method of excluding children affected was strictly carried out in these schools. The children's heads were regularly scrutinised, and children were not admitted to school until found by the Central Assistant to be free from the disease. This method proved a partial success in that increased attention was given to treatment by a proportion of the parents, but it signally failed to stamp out the affection in the school. Why was this so? In the first place ringworm is in many cases of a very chronic nature. As regards the treatment of it a very small minority of the parents sought medical advice, others obtained applications from various other sources, others tried home remedies, while others did nothing at all. Where the disease persisted for a long period, many parents who had with excellent intentions commenced treatment, became careless and did practically nothing, the children being allowed to run the streets. The elder girls were often useful at home and the bigger boys could run errands and do odd jobs.

All that was undertaken before the advent of school medical inspection. When medical inspection was established, the inspectors excluded all children found with ringworm. Excluded children were only re-admitted on producing a medical certificate, or when certified by the school medical inspector to be free from ringworm. Many parents refused to obtain medical certificates because of the expense, and, as it was impracticable for the school medical inspector (unless under very special circumstances) to visit schools oftener than twice a year, some children came to be excluded for long periods.

To obviate the necessity for such long exclusions the West Riding Education

*Read at a Meeting of the Yorkshire Branch of the Society of Medical Officers of Health on March 8th, 1912.

Committee passed a resolution that the head teacher and school attendance officer, in the absence of a medical opinion, should exercise their judgment as to when a child, who had been excluded for ringworm, was fit to be re-admitted to school. This decision seemed in many cases to lay too much responsibility on the two officers mentioned. Besides, as both of them were usually anxious to have the average school attendance at its highest possible level, it resulted in many children being back in school a week or two after exclusion, nothing whatever being done for either the cure of the disease, or to prevent the spread of infection. The whole regulation of ringworm in our schools became most unsatisfactory.

At this juncture the school medical officer proposed to his committee that an experiment be conducted in three schools, these being selected because of the prevalence of ringworm in the district. The infected children were to be allowed to attend school under certain precautions, the results to be closely observed. A washable calico cap had to be worn under the ordinary head gear and the cap had not to be removed in school. It was proposed also to supply suitable applications. The object of the experiment was to ascertain if, under these conditions, the spread of ringworm in the schools could be controlled.

The Committee were greatly interested in the proposal and in May, 1910, passed the following Resolution, a copy of which was sent to the Board of Education:—

"That an experiment conducted by the County Council Medical Staff be tried of treating in certain selected schools pupils affected with ringworm or other contagious skin disease, and that the approval of the Board of Education to the scheme be obtained."

It was further intimated to the Board that operations would be undertaken in a selected district, and that the expenditure in connection with the provision of caps and suitable applications would be limited in the first case to £10.

Because of the Committee's proposal to spend on treatment money from the rates it was necessary to obtain the Board of Education's sanction to the scheme. That was obtained in November, 1910, with a request that a report be made on the experiment, and that a copy thereof be supplied to the Board.

It will be noticed that the Resolution applies to contagious skin diseases, which among scholars include chiefly ringworm, scabies, and

impetigo. The two latter may be dismissed with a few remarks. Several very slight cases of impetigo were found, but not of such a nature as to require special attention from the medical staff. With regard to scabies only 4 cases were found. These were readily cured by the usual means, without any interruption of school attendance. The paper henceforth will apply to ringworm alone.

The next step was to draw up the following code of instructions for the guidance of parents and teachers.

WEST RIDING EDUCATION COMMITTEE.
NOTICE REGARDING CHILDREN SUFFERING
FROM RINGWORM.

1. A child affected with ringworm of the head may be excluded from school for months or even years if not properly treated.
2. The West Riding Education Committee are willing to allow such children to attend school if the following measures are faithfully attended to. Parents can provide the materials themselves, or the Education Committee will provide them free of cost.
3. The affected part of the head must be washed every morning with carbolic soap and treated with a curative application which can be obtained through the head teacher.
4. A washable calico cap must be worn continuously during the day underneath the ordinary hat. Two of these caps will be given so that they may be changed twice a week. After being used for three days the calico cap must be boiled.
5. The caps and hats of an affected child must be kept separate from those of other children. A separate comb, brush and towel must also be used.
6. The curative application is for outward use only, and must be kept in a place of safety. When it is finished a further supply can be had through the head teacher.

JAMES ROBT. KAYE,
School Medical Officer.

Operations began with a scrutiny of the heads of all children in attendance at the three schools in order to find out those affected, and immediately upon receipt of the Board of Education's sanction to the scheme I met the parents by appointment at the schools and

explained to them the proposals, and required of them. They seemed mostly anxious to have their children back at school, and at the time the instructions were well carried out. A difficulty was experienced all along, however, in getting some parents to consent to get their girls' hair cut. It might be thought there would have been difficulty in getting the children to wear the calico caps, but that was met with less often than might have been expected.

At the first inspection 2,190 came under scrutiny, and of these 40 were found with ringworm of the head. Some of these had formerly been excluded from school but had returned, others were discovered for the first time, but all were sitting among the other scholars, nothing whatever being done either in the way of treatment or of precaution against infecting other children.

Afterwards other children to the number of 31 were, during the 6½ months of the experiment, found with ringworm of the head and came on the list. Of these 15 were infants newly admitted to school, 14 were children who had been absent from school for some considerable time (mostly because of ringworm) and were seen by me for the first time on their return, and the remaining 2 cases were brothers who had been in regular attendance at school, the elder of the two being found in March with a small patch of ringworm. These two cases are fully discussed later under the head of "Question of Spread in School."

Cures were effected in the case of 28 children, and it is practically certain that this number could easily have been augmented if more of the cases had received proper attention in accordance with the precautions prescribed. Cases were regarded as cured when three successive specimens of hair had been microscopically examined with negative result.

(a) Cases Cured.		Duration of Cases.
		Months saved in attendance
1 at ½ month.	...	0.5
4 " 1 "	...	4
2 " 1½ "	...	3
3 " 2 "	...	6
1 " 3½ "	...	3.5
4 " 4 "	...	16
2 " 5 "	...	10
3 " 6 "	...	18
8 " 6½ "	...	52
28		113

* $\frac{113}{28} = 4.03$ months,—average time saved per scholar cured.

THE CASES NOT CURED.		Months saved in attendance.
By	Time	
1	1 month	2
1	2 "	16
1	2½ "	2.5
1	3 "	3
2	4 "	8
1	4½ "	4.5
2	5 "	10
1	5½ "	5.5
1	6 "	6
24	6½ "	156
43		213.5

* $\frac{213.5}{43} = 4.96$ months,—average time saved per scholar not cured.

Therefore the aggregate time saved in attendance during the six and a half months by allowing the affected children to come to school amounted to 326.5 months (approximately 13,000 attendances), equal to an average of 4.6 months per scholar. It can easily be understood how much it was to the benefit of the affected children to be enabled to continue their education during all that time, and besides the total government grant saved was very considerable.

Cost of Experiment.—The Board of Education sanctioned an expenditure of £10 on caps and applications, and that sum more than sufficed.

The cost of these items was as follows:—

	£	s.	d.
Applications	...	3	1 0
Calico Caps	...	4	16 0
Totals	...	7	17 0

If that sum of money be divided among 71 scholars for an average time of 4.6 months, the cost of treatment per month per scholar works out at 5½d.

In one of the schools only three cases were found, all girls. The parents of one refused to comply with the regulations during all the time of the experiment, and so she was excluded. The others continued in attendance, and before the end were free from the disease.

It was found that the proportion of children affected was greater in the infants than in the Higher Departments, and that the proportion was lowest of all in the Senior Mixed Department.

Further it was found that the percentage of cures increased with the age of the affected children, that is to say, the general persistency of the disease was in inverse ratio to the age of the scholars.

Treatment and Precautions Adopted.—The hair was cut short, at least round the affected parts. The results were most satisfactory where the hair was cropped as short as possible all over

the head. With some of the girls there was difficulty in getting this done.

Scrupulous cleanliness was as far as possible insisted on, both with regard to the calico caps and the heads. The parents were directed to wash the affected parts free from scurf every morning, using ordinary or antiseptic soap and warm water. (N.B.—To this procedure there is some theoretical objection because of the alleged liability to spread the spores to non-infected parts of the heads. In practice, however, it was found that this method of cleansing did not spread the disease; but, on the contrary, the results were best where the cleansing received most attention.) Some of the parents added an antiseptic to the water for washing the heads.

Slightly irritant applications of the usual types were supplied, with directions that they be applied once a day after the morning wash. Three kinds of applications were tried, but the results proved that there was little to choose between them.

The caps supplied were worn under the ordinary head-gear, which again was kept separate from that of the other children.

The ringworm children did not sit in the body of the class, but were kept at the end of the seat.

The teachers were requested to have a daily parade of the infected children.

Both the infected children and the others came frequently under medical examination.

Difficulties encountered.—It was difficult to get many of those concerned to recognise that there was need for special precautions. A good many of the parents all too soon wearied in well-doing, and in these cases it was difficult to obtain the requisite degree of cleanliness, the parts occasionally were even crusted with scurf, and the caps dirty. Sometimes there was no sign of any application. The parents of neglected cases were interviewed; where there was continued neglect the children were excluded until the necessary regulations were complied with.

The children occasionally attended without the cap, and with respect to this also firmness had sometimes to be resorted to.

The daily parade of the infected children by the teachers was sometimes neglected, owing to the pressure of the teachers' ordinary duties.

No Care-of-Children Committee had been formed in the area. The matter had been repeatedly considered by the District Sub-Committee, and lack of work for a Care-of-Children Committee could not be pleaded by

the District Sub-Committee as an excuse for their inactivity. In the case of ringworm alone, not to mention other lines, the Care-of-Children Committee could have rendered invaluable assistance in the way of securing the co-operation of the parents and in smoothing out difficulties which had to be tackled by the teachers and myself.

Question of Spread in School.—In no case could it be said that there was any spread of the disease in school, and that in face of precautions sometimes laxly performed.

In one of the boys' departments four boys in all were found with ringworm, and there were still two affected at the close of the experiment. A short explanation may be added here. Two boys were discovered at the beginning of the experiment; they were patiently treated, and before the end of May were free from the disease. In the middle of March all the boys were again being examined in the school when a third boy was found with a small patch of ringworm on the top of his head. He belonged to Standard VI., and had no connection whatever with either of the other two who were in Standards I. and IV. respectively. The boy's mother refused to comply with the regulations, and the lad was excluded from the school. The mother treated the part with home remedies. After seven weeks the parents agreed to observe the regulations, and the boy returned to school. By this time the greater part of the boy's head was affected with the disease, and it seems that the mother had become alarmed at her inability to stay its progress. A few days afterwards this boy's younger brother in Standard I. was found to have contracted ringworm of the head.

There were several other instances where members of the same family were infected, and, while there was found no case of spread of the disease in school, one could not but conclude that the intimate relations of family life are more conducive to its spread in the homes.

That the high percentage of children affected with ringworm in the infants' departments was not exceptional seemed to be borne out by an examination of 77 entrants to the infants' department of one of the schools. Among these five cases of ringworm were found, giving a percentage of 6.5 affected. Here almost certainly the source of infection was in the home.

School Medical Inspection throughout the whole West Riding showed that during 1910, 1.74 per cent. of the children examined in the

routine age-groups were affected with contagious skin disease (mostly ringworm cases). Taking the individual age-groups the results were as follows:—

		Percentage of children affected with Contagious Skin Disease (Mostly Ringworm).	
Age-group 5	...	2.73	
" " 7	...	2.12	
" " 10	...	1.23	
" " 13	...	0.65	

It will thus be seen that the figures for the Riding generally, as well as those for the schools in the experiment, indicate that the prevalence of such disease decreases as the age of the scholars increases; and it may be fairly argued that, if there existed a marked tendency for ringworm to spread in school, there would not be a progressive diminution in its prevalence right through school life.

Extension of Experiment.—Before the work had been long in progress it was thought desirable to see what results could be obtained where the carrying out of the regulations was to a great extent left in the hands of the head teachers. Two further schools were selected.

The affected children in one of these schools were not asked to wear caps, and applications were obtained by the parents themselves without cost to the West Riding Education Committee. The head master saw the cases daily, and the precautions against spread of infection were thoroughly carried out. He had very useful assistance from his Care-of-Children Committee, and he obtained the co-operation of the parents of the affected children, except in the case of a girl whose mother was dead and whose father's neglect had been such as to warrant the interference and supervision of the N.S.P.C.C.

There were eight cases when the affected children were permitted to attend school. Of these eight three were cured before the beginning of June; but in the meantime three other ringworm cases were admitted, two being from the infants' department and one from outside the area, keeping the number affected at eight, as at the beginning. When last seen by me most of the cases were greatly improved, some indeed showing but small areas affected with the disease.

No child became freshly infected with ringworm of the head during the progress of the experiment, all the new cases being the three admitted. A few children were found with ringworm on other parts of the body, the source of infection being unknown. Such presented no difficulty, as the headmaster cured them simply by applying a little iodine solution.

THE Cootner school in November, 1910, ten were found to have ringworm out. By giving a percentage of 22 infected. It was reported that ringworm was widely prevalent among the cattle of this district, and that probably accounted for so many children being affected. The caps required were made by the infants' mistress, and applications were obtained by the parents mostly through the head teacher. Here also there was no outlay on the part of the West Riding Education Committee. The children were seen daily by the headmaster and mistress, and again there was no case of spread. After six and a half months all the cases were much improved, and 4 of the 12 children were quite cured. From the foregoing details of the experience gained the following conclusions may be drawn:—

- (1) Ringworm of the head is apt to prove an extremely chronic affection.
- (2) If suitable precautions are adopted against spread of infection, children suffering from the disease may be allowed to attend school without danger to the others so that the children's education is uninterrupted, and government grants are not reduced.
- (3) The regular scrutiny of the children's heads had a marked effect on the general cleanliness of the heads, especially in the case of the girls.

Policy suggested for the control of Ringworm in School.—Ringworm is prevalent among the elementary school children of the West Riding but probably not more so than in many other districts. The policy of exclusion is for various reasons not to be recommended. X-Ray treatment has much to recommend it, where the area is compact and the means of conveyance ample. In the West Riding, however, it would be unsuitable owing to the great difficulty and expense of conveying the patients to the apparatus or the apparatus to the patients. Besides, it is very questionable whether ringworm among children can be absolutely eradicated as long as the sources of infection from the area are so numerous.

All head teachers and parents could be taught to understand how desirable it is to detect the disease and prevent its spread, and to take all precautions towards that end, it is very probable that, all being under the supervision and direction of the school medical inspector at his routine visits, at least the spread of the disease could be controlled, especially if the

caps and applications were supplied by the Education Committee. The *insuperable difficulty*, however, must be acknowledged of getting each one concerned to recognise properly the responsibility. As is before said, a Care-of-Children Committee could be extremely useful in this work, just as they have proved their worth in the amelioration of other conditions. If in addition the services of a school nurse could be obtained all the machinery necessary for tackling the ringworm problem would be to hand. She would co-operate with the school medical inspectors and with the head teachers in the examination of the heads and in the general supervision of the cases. She could visit at the homes and instruct the parents where necessary. She could from time to time take specimens of the hair and send them to the laboratory for microscopic examination.

The great drawback to the employment of school nurses for ringworm and other "following up" work arising out of school medical inspection is that there would be so little work of this kind in the more thinly peopled areas of a large county that in many cases much of the nurse's valuable time would be frittered away in travelling between the cases.

A little reflection, however, shows that other duties than mere "following up" work could with great profit to all concerned be undertaken by a lady with a nurse's training. For example, in the schools the *teaching of hygiene, home management, physiology, home nursing, etc.*, might conceivably be undertaken in those areas where her appointment would not be justified solely for "following up" duties; or a combination of the work of school nurse with that of *health visitor* on behalf of the local sanitary authority is a possibility. Or again, arrangements might reasonably be made for the school nurse to take up the duties of School Attendance Officer in certain cases; and this with the two-fold advantage that whilst she would not make the mistake of compelling the attendance of an unfit child, she would not readily be misled by an unfounded plea of ill-health. By so widening the scope of the school nurses' activities the area allotted to each would necessarily be reduced, so that the proportion of time spent in travelling would be small.

School Medical Inspection shows more and more the usefulness of "following up" work, and its importance is emphasised by the Board of Education. Valuable results in this line have been achieved in many districts by

Care-of-Children Committees, but the Care-of-Children Committee and the School Attendance Nurse are not mutually exclusive,—on the contrary, the sphere of the School Attendance Nurse can properly be regarded as complementary to that of the Care-of-Children Committee.

INSANITARY AREAS IN GLASGOW.—In representations touching areas in Blackfriars, Hutchesontown, Cowcaddens, Townhead, and Whitevale, Dr. Chalmers submitted the following statistics:—"These 'death areas' contain many foreigners, and are very similar in character, varying from two-and-a-half to three-and-a-half acres in extent. The population on each is about 1,500 persons, occupying for the most part one and two-roomed houses (*anglice*, tenements). In the city, as a whole, the number of persons per acre is about 60, in the combined areas referred to it is 460. The average number of square yards per person over the city is 80; in these areas this is reduced to 10.5. The average death-rate in the city from 11 causes is 16.4 per 1,000 living; in the combined areas it is 22.7. From respiratory diseases the deaths in the city are equal to 3.1 per 1,000 of the population living; in the areas under review the rate is exactly double (6.2 per 1,000). The average infantile death-rate is 136 per 1,000 births; for the combined areas it is 180 per 1,000; while in Hutchesontown area 282 children out of every 1,000 die."

APPOINTMENTS.

DR. JAMES P. CULLEN has been appointed on the staff of the King Edward VII. Welsh National Memorial.

DR. DENNEHY, of Lismore, has been appointed by the Waterford County Council as medical officer for the Abbey-side tuberculosis dispensary.

J. BELL FERGUSON, M.B., Ch. B. (Edinburgh), D.P.H. (Manchester), appointed chief tuberculosis officer, City and County of York, formerly assistant medical officer of health and medical officer-in-charge Tuberculosis Dispensary County Borough of Leicester.

DR. E. A. FREEAR WILKES has been appointed assistant medical officer of Hampshire.

DR. J. R. GILLESPIE, Southampton, has been appointed by the Down County Council as medical superintendent of the tuberculosis dispensary.

DR. M. HALFPENNY, J.P., medical officer of Scotstown dispensary district, has been appointed tuberculosis officer by the County Council of Monaghan.

J. KING PATRICK, M.B., Ch. B., B. Sc. (Public Health) Glasgow, D.P.H. Dublin, resident medical officer Borough Isolation Hospital and Groby Road Sanatorium for Consumptives, Leicester, and formerly assistant medical officer of health and school medical officer, County of Ayr, has been appointed assistant medical officer of health and medical officer-in-charge of tuberculosis dispensary, County Borough of Leicester, *vice* Dr. J. Bell Ferguson.

DR. THOMAS ROBERTS, of Wrexham, has been appointed county medical officer of health for Denbighshire.

SOME OBSERVATIONS BEARING ON PROF. PEARSON'S RESEARCHES ON TUBERCULOSIS.

BY R. J. EWART, M.D., F.R.C.S., M.Sc., D.P.H.

LET me state at the outset that I do not approve of destructive criticism. If a stone in the structure of our science be faulty it is hardly advisable to remove it, unless we have a better to put in its place. Thus it seems to me that the popular articles Professor Pearson has lately presented to us are lacking in that constructive attribute. Still I think we owe a great debt to the work of the Eugenics Laboratory for the able way in which the necessity of number has been demonstrated.

From my own experience, however, of the public health branch of the medical profession I certainly am not of the opinion that the members of that branch err on the side of credulity, nor do I think there could be found a single instance where a medical officer of health has blindly applied to his district data collected in another. In this way a healthy suspicion and repetition of observation largely remove the element of "chance," against which Professor Pearson has warned us. It seems to me, moreover, that the possibility of such a source of error is already appreciated, though we owe to him its mathematical expression, and that a further stage has been reached, one which he at times overlooks, namely that of homogeneity of material.

If the data be pure but scanty the odd chance that it may show a lead sequence, but if it is not homogeneous that possibility disappears. There is difficulty in collecting vast masses of material it is tedious and irksome perhaps, but to large series of observations that show biological similarity except in respect to the quality, consideration is a matter in which judgment and considerable care are necessary. Let us always keep in mind a saying, which I believe comes from the lips of Charles Darwin, "Nature is a subtle dame; she will tell you a direct lie if she can."

To exemplify this point I will give a few examples. If we take a general survey of the work on Phthisis that has emanated from the University College, London, we must be struck with the comprehensive way in which the term "Tuberculosis" is used.

I cannot help calling to mind a warning given to me by one of my teachers in my

student days, namely, that scientifically the designation "Pulmonary Tuberculosis" should be limited to those cases in which the bacillus has been found in the sputum, irrespective of the condition of the patient, and that all other cases should be called "Phthisis." This criterion would, of course, exclude a large number of early cases, which in all probability were tuberculous, but still it also excludes such as are not of that nature. Thus the error becomes a negative one only, and not positive and negative, which, from a statistical point of view, simplifies the problem.

Within recent years, other physiological tests have come into use in the diagnosis of Pulmonary Tuberculosis. Nevertheless, in dealing with such a problem as the association of consumption in husband and wife it surely would have been helpful if it had been stated whether the bacillus was present or not in the ejecta.

When we consider the grounds on which an opinion is formed, as to whether a patient is, or is not, suffering from this disease, we realise the necessity of a simple test; thus it is a well known fact that such characters as the height-weight ratio, texture of skin, facial appearances, shape of chest and temperament, all influence the diagnosis, and, more than that, a knowledge of the family history is very apt to make a difference in our decision. All these characters are admittedly of a hereditary nature, and it is just as well that they should be excluded in scientific work. Personally, I find it almost impossible to limit one's self purely to physical signs, as detected in the chest, when examining healthy and diseased persons indiscriminately. The sub-conscious suggestion from a general survey is very strong, and it must be a factor influencing the Physician or Specialist.

So that if we are investigating the strength of the transmission of the phthisical tendency, and we, to some extent, base our diagnosis on qualities that are transmissible, it is not surprising that we should obtain high correlations, and I must admit that I fail to see how any manipulation of data would remove a possible source of error of this kind. Statistically, as bacteriologically, the criteria should be the presence of the bacillus in the ejecta during life, its demonstration in the tissues after death, or one of the lately introduced tests, but in questions involving the transference of infection, the bacillus itself should be found in such a situation as would render its introduction into a second person beyond

question. I do not think these ideals are pedantic; they are, in my opinion, simple precautions necessary to ensure the biological homogeneity of material, and as far as I can see in none of the publications of the Eugenics Laboratory has any attempt been made to purify the original data on which such elaborate precautions were taken to avoid chance factors. To take another point:—In his *First Study on Pulmonary Tuberculosis* (page 21) Professor Pearson definitely states that first children are more susceptible, and last children less, to this condition. To criticise the handling of the material, would be an impertinence on my part, but I am, perhaps, in a better position than he to judge the biological nature of the data. Is it fair to say that a woman who reproduces 14 children is similar in character to one who reproduces one or two, and thus totally ignore a possible hereditary factor? Would it not have been better to have given the type of parent some consideration?

I have data to show that women who reproduce big families, are, in many respects, different from those who reproduce small ones, and I suggest that had this factor been considered the sequence would have been reversed after the fourth child.

Take the following figures from page 20, just the page before that on which the above statement appears.

Both parents tuberculous ...	mean size of family	3.50
One parent " ... "	"	5.42
Neither parent " ... "	"	5.82

If heredity counts for anything we should expect the early child, in a general population, to possess a greater phthisical incidence from this observation alone. Again, take Dr. Buchan's figures, which I have corroborated quite independently, showing that the general death-rate amongst children steadily increases as they progress in sequence from the second onwards.

How can we be sure that, had these children lived, they would not have developed, in course of time, tuberculosis in a ratio exceeding that of those surviving? and I think I am justified in saying that as the family increases, the tendency to tuberculosis in the parents diminishes, though this must not be taken to mean that child-bearing of itself reduces the phthisical diathesis. Hence, I have no doubt, that if the material were purified in this way, the influence of birth sequence would be found to agree with that demonstrated by Mr. Heron for Insanity.

At the International Congress on Eugenics last August, Mr. Macauley, President of the Society of Actuaries of America, drew attention to an even more serious statistical fallacy, one which could easily have been avoided had the precaution been taken to estimate the mean ages of each group of siblings. He pointed out that the method of selection was not a random one, and that the Professor had included units of all ages, many of which would of course be infants or children. The point may be expressed in another way—If the basis of selection is that of families taken at random, a greater proportion of first births will have reached the phthisical age than late births, and hence the greater incidence.

In the *Journal of the Royal Sanitary Institute* (August, 1912) the Professor has ridiculed some suggestions of mine based on 79 cases of Pulmonary Tuberculosis. His objection would be perfectly valid had I stated that my figures were beyond chance error, but I did not. I had, however, taken the precautions necessary to secure some degree of similarity in my comparisons. Thus, the Tubercle Bacillus was found in all cases, the mean ages of my tuberculous and normal populations were the same, the sex distribution was similar and the social grades from which they were taken were alike.

How many of these requirements were satisfied in the 400 cases, that Professor Pearson used? If my surmise be correct he compared persons with a mean age of about 28 years with a population whose mean age was under one year. We are, I think, justified in refusing to accept such unscientific work. It is interesting to note that an increase of the number in my own data has verified the original observation, namely, that this disease is more frequently met with amongst those born at the extremes of life than those born at maturity.

Though I do not wish to labour these queries, let me, however, take two other examples of error arising from this lack of biological homogeneity.

I take, in this case, "*A Second Study in Pulmonary Tuberculosis—Marital infection, and from this I turn to a popular pamphlet—'Tuberculosis, Heredity, and Environment (1912)'*"—and the first thing that strikes me is the difference in attitude that has taken place in the four years, 1908-12.

In the first and more elaborate memoir the data are discussed, and some of their peculiarities are noted, and the possible fallacies set out.

The later pamphlet largely draws from the former, though some work by Dr. Goring is added, but the main difference is the alteration in tone. Where error was admitted as likely before, now it is excluded and facts are given us to be swallowed whole. It seems to me that the possibility, that Phthisis may shorten life, has been overlooked, and that such units would hardly be met with in a random selection as often as might be expected.

The natural reply to this is, that we can go to the churchyard as well and there complete our investigation. It is surely not necessary for me to state that people do not reproduce under such conditions.

This would not be a source of error, however, were the point under investigation one other than hereditary transmission of character. That is to say, a character that tends to shorten life, before or during the reproductive period, will be found less frequently than it should be in a random selection.

This contention is applicable to the data relative to marital infection, which Professor Pearson has collected from his own records. Nowhere, so far as I can see, does he give the mean ages of the three groups—healthy, one mate phthisical, and both phthisical, and thereby allowing a correction to be made.

To put the point shortly, I take the following from his own work:—

PEARSON.—PROFESSIONAL CLASSES.
TUBERCULOSIS.

HUSBAND.				
Actual.	Wife.	Not T.	T.	Totals.
	Not T.	902	43	945
	T.	49	6	55
		951	49	1,000

Correlation 0.24

HUSBAND.				
Chance.	Wife.	Not T.	T.	Totals.
	Not T.	899	46	945
	T.	52	3	55
		951	49	1,000

Transfer
+ 3 - 3
- 3 + 3

INSANITY.				
Actual.	Not I.	I.	Totals.	Correlation 0.24
Not I.	856	71	927	
I.	60	13	73	
Totals	916	84	1,000	
Chance.	Not I.	I.	Totals.	+ 7 - 7 - 7 + 7
Not I.	849	78	927	
I.	67	6	73	
Totals	916	84	1,000	

The conclusion deducted from the above is, that since there is as much association between husband and wife with reference to Insanity as Tuberculosis, the infection factor cannot be very strong. The question I ask is, what were the mean ages of the classes given? Should the mean age of the group tuberculosis in husband and wife be less than the others, as it probably was, then the requirements of biological homogeneity are not satisfied.

I cannot, however, allow this example to pass without expressing some appreciation of the aptness and subtlety not only of the illustration, but of the whole line of argument pursued in that paper.

Then again, take Dr. Pope's data with reference to the presence or absence of Phthisis in the parents of offspring suffering from that condition and marital infection. The basis of selection, it has to be remembered, is parents of tuberculous offspring. Turning to the quotation already given, we see that where both parents were tuberculous, the mean family is 3.5, and where one only 5.4. Hence on this basis, the number of occasions where this disease was present in both father and mother of a tuberculous offspring, should be multiplied by two, or more accurately, $\frac{5.4}{3.5} = 1.5$. Surely this would increase the correlation between husband and wife for this condition so that a most important step in the subtle chain of reasoning, with which the Professor entranced us last March, may be most fallacious.

In dealing with alterations in death-rate from phthisis, in the latter part of the same paper, he seems to me to be obsessed with the law of natural selection and survival of the fittest. I have suggested other explanations, as a possibility, and have brought his ridicule and cutting scorn upon my unpretentious efforts. I have collected some data which seem to show some connexion between the alteration in the reproductive habit, and the lowered death rate, and I hope to obtain further evidence in favour of this hypothesis later.

Again, in the generalisations in "*The Fight Against Tuberculosis, 1908*," he has blindly assumed that the virulence of the bacillus is a constant, and has not varied in the last hundred years, yet, from laboratory experiments, I think we should all agree that of the variables—man and tubercle bacillus—the latter is the less constant factor.

Yet another rather disturbing possibility arises, concerning which investigation is necessary, namely, that if we replaced the word Tuberculosis by Scarlet Fever, in the memoirs already referred to, they would read equally well with perhaps some slight alterations, due to the different nature of the diseases as regards duration. These conditions appear to have two characteristics in common. Firstly, the infection is much more widely diffused than is supposed; and secondly, the reaction, as we mean it—that is, discomfort to ourselves; a different state from reaction in the sense of simple infection, which includes a condition of symbiosis as well as parasitism—is dependent on inherited characters.

Lest the reader may dismiss the foregoing suggestion as fanciful, let me give one series of observations out of a number of such, which he can verify in his own district should he care to take the trouble. I have not as yet calculated the probable errors, but in any case they will be small.

The incidence of Scarlet Fever has been found to be as follows:—

Up to and including	5 to 6 years	... 4 to 5 per cent. attacked.
" "	7 to 9 "	" 7 to 8 "
" "	13 to 14 "	" 13 to 14 "
Reproducing women	...	17 "

Thus if we take the number per hundred of mothers who have had scarlet fever as 17, and of their offsprings as 14, how often would we expect in 100 trials to meet a mother and child both of whom have had Scarlet Fever?—obviously the number is $100 \times \frac{17}{100} \times \frac{14}{100} = 2.7$, or about once in 50 times.

Now in 446 children 60 had been attacked with this disease, the mothers had been similarly affected in 28, or approximately 45 per cent., and out of another series of 58 mothers who had had Scarlet Fever, and possessed a child of 6 years of age, 28 or 46 per cent. had already been attacked. It is to be observed the number attacked in the general population is 4 per cent. at this age. Lastly, out of four hundred pairs taken at random, the children being of constant age, Scarlet Fever was found in both parent and children, 7 per cent. The expected number being 2.7 per cent.

It is obvious, I think, that the tendency to re-act to the virus upon which this disease depends is a transmissible character, and further, for such a strong correlation to exist, the infection must be practically everywhere, as very few susceptible units seem to escape.

Another way by means of which the same point may be shown is to take the number of houses in which two or more cases occur. In the town under consideration there are 15,000 households approximately, and close on 200 cases of Scarlet Fever are notified per annum. Now as a matter of chance two cases in one house should be met with about once or twice each year. It is found, however, that 20 per cent. of the cases occur in households in which someone has been infected within the previous three months.

If the micro-organism were the sole factor, and the soil counted for nothing, the percentage should rise to 75 per cent.; for in that number of households are there children of susceptible ages. In measles, for example, 75 per cent. of children brought into contact with a previous case eventually develop the disease.

I do not wish in the present instance to carry this line of inquiry any further. All I desire to indicate is that a comparison between Tuberculosis and Scarlet Fever would have been most helpful, and I fancy would have led to some modification in the dogmatic statements made by Professor Pearson.

Further, it should not be assumed that all the research that he has done on this subject is unreliable owing to its faulty biological basis. In the main, I believe it to be correct and to agree with those somewhat vague impressions that slowly grow in the minds of those who handle considerable quantities of material and who are in any way observant.

If I may dare to generalise I would say that organisms are freely transmitted from individual to individual; but whether they

become symbiotic or parasitic depends on the nature of the soil. In the case of Scarlet Fever we have isolated all those upon whom this organism becomes parasitic—probably a small proportion only of those upon whom it is symbiotic—with the result that, while the gross amount of infection amongst us has not been materially altered, we have prevented the organism from becoming enhanced in its virulence, and hence we get a fall in the death-rate, but not in the attack-rate.

It is, therefore, possible that the control of those upon whom the tubercular organism becomes parasitic may have the same effect as isolation has had on the death-rate from scarlet fever.

I do not suggest this as proved, but simply to justify the doubt I feel as to the truth of the little facts that Professor Pearson thinks he has adequately demonstrated, and also to draw some attention to the importance of biological homogeneity rather than number of observations as an ideal.

If the data be pure, and the number adequate, I do not think elaborate mathematical methods are necessary to draw an accurate conclusion as to which way the bias tends, though to measure it we must hand our work on to those specially trained in the handling of figures.

Let me, in conclusion, say that I have not made these observations in any carping spirit, but simply to try to correct a tendency which seems to me to be leading to error.

NOTE.—The papers and memoirs referred to are as follows:—

- I. First Study of the Statistics of Pulmonary Tuberculosis (Inheritance). By Prof. Pearson (Dulau and Co.).
- II. Second Study of the Statistics of Pulmonary Tuberculosis (Marital Infection). By G. Pope, revised by Karl Pearson (Dulau & Co.).
- III. Tuberculosis—Heredity and Environment. By Karl Pearson (Dulau & Co.).
- IV. The Fight against Tuberculosis and the Death-rate from Phthisis. By Karl Pearson (Dulau & Co.).
- V. Eugenics and Public Health. By Karl Pearson. Journal of the Royal Sanitary Institute, September, 1912.

TOWN OR SUBURB?—Is there any indication of the present craze of getting out of London to the suburbs—supposed to be more or less rural?—passing away? According to the medical officer of health of Islington there are signs that the lure of suburban rurality is found to be too heavily handicapped by the longer train journey, with its inherent waste of time and money, and the household difficulties associated with absence from centres of distribution.

"SMOKE PREVENTION."

A PRACTICAL EXAMPLE.

By ERNEST WATT, M.D., B.Sc. D.P.H., Medical Officer of Health, Partick.

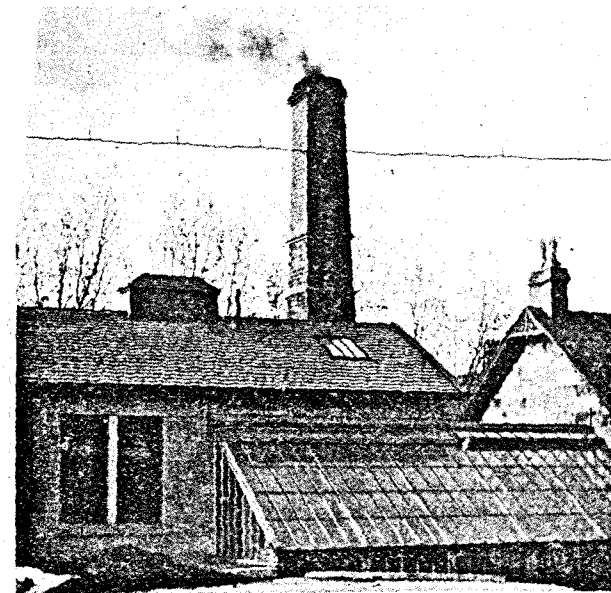
THE following paper is based upon an experiment, conducted over a period of a year, to prevent smoke nuisance caused by the boiler furnace of an infectious diseases hospital.

Cause of the Nuisance.—Early in 1909, a new boiler was installed at Knightswood Hospital (the infectious diseases hospital of the Burgh of Partick). The stack in connection with the furnace is only 40ft. in height. In certain directions of the wind, the smoke nuisance at three of the wards was very obvious. In fact

and coke would at least diminish the output of smoke. This suggestion was carried into effect, and continued until March, 1911. It was then discovered that the mixture of fuel, while it had to some extent diminished the smoke output, had unduly injured the fire bars. Since that date therefore, coke alone has been used, and as a complete year has elapsed I think some observations upon the results achieved are justifiable.

The former smoke nuisance has been completely removed, and the following photographs demonstrate this better than words.

Thus No 1 taken immediately after stoking with nuts, shows a large quantity (typical of the circumstances ruling formerly) of black

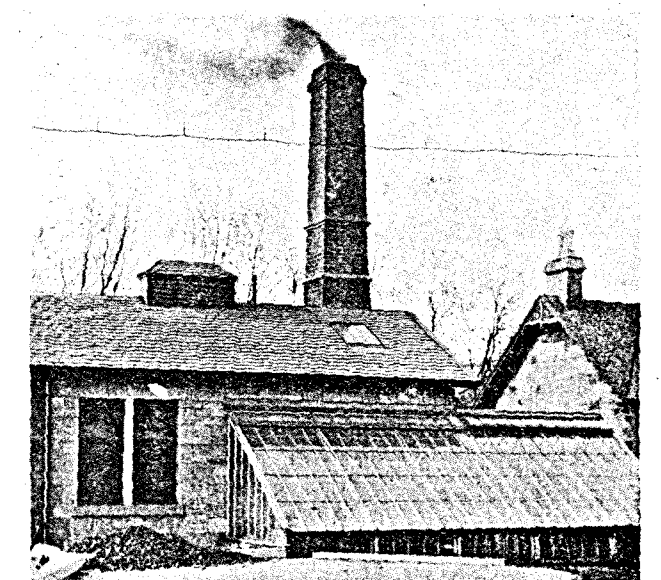


PHOTOGRAPH NO. 1.

if the windows of these wards were open at such times, the atmosphere inside was most objectionable.

Description of Boiler, etc.—Marine type, 8ft. inside diameter, and 8ft. long; furnace, Deighton's withdrawable; working pressure, 50 lbs. (from 6 a.m. to 6 p.m.); steam is supplied to the laundry and to the disinfectant.

Method of Preventing Smoke Nuisance.—During 1910, some consideration was given to the question of increasing the height of the furnace stack as a means of achieving this end. It was suggested, however, by a member of the committee, that a mixture of equal parts nuts (pieces of coal averaging about 1-inch)



PHOTOGRAPH NO. 2.

smoke issuing from the stack; No 2 is taken 20 minutes after stoking with nuts, and shows little diminution in the quality of the smoke; it might be added that only after an interval of 40 minutes was there any marked diminution in the amount of black smoke; No 3 is taken immediately after stoking with coke, and it fails to show any visible smoke; No. 4 is a photograph of a portion of one of the wards towards which smoke (nuts in use) is blowing. As the smoke is passing about half way between the ward and the camera, it is not in focus, but one can easily see that considerable blurring of the picture is caused by it between the points marked x x.

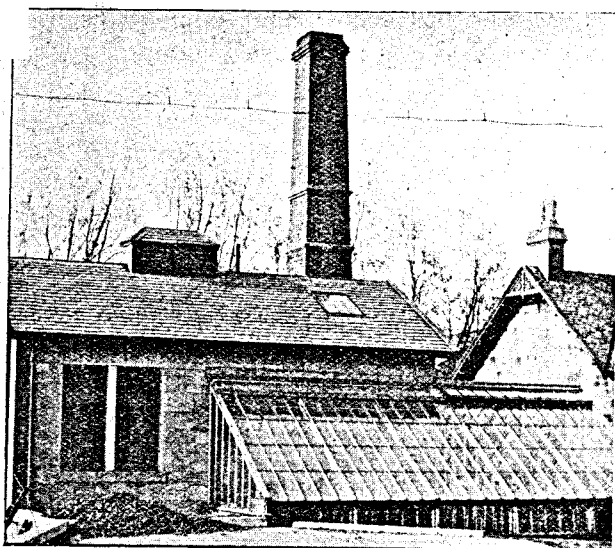
Cost.—Probably the best manner in which to express this is to give the amount in weight of nuts and coke consumed over a period of one year each. Taking the year 1909-10 (when nuts alone were in use as fuel), the quantity consumed was 236 tons, or an average of about 19½ tons per month; while from April 1911 to March, 1912 (coke alone in use), 222 tons or an average of about 18½ tons per month were consumed. Owing to fluctuation in the market values, and also the variation in prices in different districts, an accurate comparison of the cost of these materials is fallacious, but it may be stated that in the present instance, the contract price for nuts was 10s. 6d. per ton, and for coke 11s. 6d. 236 tons of nuts cost

working the tonnage of nuts and coke was very similar (a difference only of 14 tons), the above colorific values are of special interest.

I might add that at the hospital equilibrium volumes of nuts and coke were weighed, and the latter was found to be 1/10th of the former.

Drawbacks to the Use of Coke as Fuel.—(1) Greater cost, (2) more ash, (3) more careful stoking, and greater difficulty in "damping down," (4) greater bulk of material to handle.

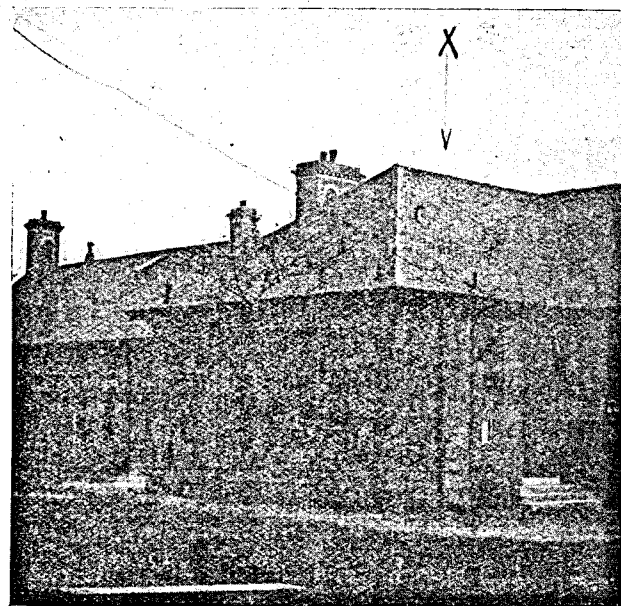
With reference to the cost it has to be pointed out that the freedom from smoke is worth the difference (about £4 over a year). Drawbacks (3) and (4) were readily met by the engineer, as when nuts were in use he had to



PHOTOGRAPH No. 3.

£123 18s. 6d. This line of inquiry any further. All I desire to indicate is that a comparison between Tuberculosis and 222 of coke £127 13s. Thus most there has been a slight monetary loss in order to gain freedom from smoke.

Calorific Value of Coal and Coke.—According to Prof. T. Gray, Glasgow Technical College, to whom I am indebted for the figures, an average value for Scotch coal lies between 12,600 and 13,000 Brit. thermal units per lb. while two samples of coke gave each about 13,200 Brit. thermal units per lb. It has to be pointed out, however, that owing to the variation in the percentages of ash and water in different samples, no accurate general conclusions can be arrived at from these data. In view, however, of the fact that over periods of a year each and under similar conditions of



PHOTOGRAPH No. 4.
The Statistics of Pulmonary Tuberculosis (Inheritance). By Prof. Pearson (Dulau and Co.).
II. Second Study of the Statistics of Pulmonary Tuberculosis.

sweep the boiler tubes daily, whereas with coke once a week suffices. This he considers to be ample compensation.

Conclusions.—I fear that, so long as the inferior (and generally more smoky) qualities of coal can be got more cheaply than coke, no attempt on a large scale will be made in the direction of using the latter with the object of improving our smoke-laden atmosphere. Mechanical stokers have done much to solve the problem even when using dross, but the capital outlay is considerable. For small boilers, such as the one which forms the subject of this paper, coke is to be commended when it is desired to spare the atmosphere from smoke pollution.

ISOLATION HOSPITALS.*

THE Local Government Board have issued a report on Isolation Hospitals which gives account of the "more modern developments in the design of isolation hospitals," and contains much information concerning the cost of construction of hospitals which have been provided by various sanitary authorities. The fact that this report has been written by Dr. H. Franklin Parsons is the best guarantee of its value which the reader can desire.

In his introductory chapter Dr. Parsons refers to Sir Richard Thorne's original report on hospitals for infectious diseases which was published in 1882, and was re-issued in 1900 with a preface by Sir William Power who was then the Medical Officer of the Board. Sir William Power pointed out that "while the general considerations set forth in the first part of the report (i.e. the report of 1882) still held good, needing modification only in one respect, none of the individual hospitals described in the second part of the report afforded models which could with advantage be closely followed at the present day." Hence the need for some description of more modern hospitals than those existing at the time of Sir Richard Thorne's first report, and for the supply to sanitary authorities of information on hospital design and construction more deserving of utilisation than that which was available thirty years ago.

In an interesting chapter on the utility of isolation hospitals, Dr. Parsons states reasons which may be urged for and against the view that isolation hospitals have been effective in diminishing the prevalence of scarlet fever. There appears to be no reason for doubting that the decline in recent years is in the main a natural phenomenon, and the recrudescence of diphtheria a few years ago supplies ground for thinking that the trend of epidemic prevalence generally is independent of such control as is exercised by isolation of recognized cases of this disease. The acceptance of this view does not, however, militate against that which recognizes that isolation hospitals serve a useful purpose not only in relieving households of the incubus of infective persons in their midst, but also of limiting the period during which these persons are a source of danger to other members of the family. While, therefore, the old belief that infectious disease can be

"stamped out" by isolation in hospital, is no longer heard of, the view that isolation hospitals are of practical value is still maintained.

In respect of smallpox, Dr. Parsons observes that there is no question of the value of isolation in a suitably situated hospital in preventing the spread of the disease. Dr. Parsons' opinion on this point will be abundantly endorsed by medical officers of health, who have had experience of the readiness with which smallpox spreads when persons suffering from this disease are left in their own homes, the inmates of which are unprotected by vaccination. In the same way, while the value of a well-placed smallpox hospital is still recognized the need for application of the lessons taught by Sir William Power concerning the influence of smallpox hospitals still remains, and the condition under which the establishment of these institutions is approved by the Board has not needed to be modified by subsequent experience.

Variation in the type of scarlet fever, to which we have already referred, is probably responsible, in some degree at any rate, for the fact that Dr. Parsons was called upon to discuss in his report new methods of dealing with cases of this disease, both inside and outside hospitals. Dr. Curgenven and Dr. Robert Milne's method of inunction, it has been suggested, might render hospital isolation unnecessary. On this point Dr. Parsons tells us that the experience of hospital superintendents, who have tried the method, has not been favourable, and he cites that of Dr. Biernacki at the Plaistow hospital in this respect.

The subject of the planning and construction of isolation hospitals constitutes perhaps the most important matter with which this report deals, and in its consideration in an early stage Dr. Parsons has had the co-operation of Mr. Kitchin, the architect of the Board. Later Mr. Kitchin's other duties prevented him from continuing this work. Dr. Parsons discusses at length the sufficiency of the different methods by which infection may be thought to be communicated, and considers these in relation to the different designs of hospitals which have been provided. Thus, the "barrier system" is merely a system of control of attendants, and leaves patients suffering from different infectious diseases in aerial communication with each other. A more complete system may be provided by the patients' beds being structurally and completely separated from

* Report on Isolation Hospitals, by H. Franklin Parsons, M.D. (Supplement to the Annual Report of the Medical Officer of the Board for 1910-11). London: H.M. Stationery Office, 1912, Cd. 6342.

each other, and the compartments being entered from the open air, or from the same corridor, or the compartments may be separated from each other only by partitions not reaching the ceiling. Dr. Parsons says that the experiences of Dr. Biernacki with the "barrier" system, and of Dr. Caiger with the partially separated cubicles at the South Western Hospital are that these methods suffice to prevent cross infection in the case of diseases of short "striking distance," namely, those in which transmission is chiefly by mediate infection, but that they fail where infection is more diffusible and can be conveyed by aerial convection, such as chicken pox, measles, and in less degree, scarlet fever. An especially useful chapter in the report is that devoted to the planning of such compartment and cubicle blocks, the different designs being illustrated by plans.

Another important question discussed is that of the cost of construction. This appears to have increased in recent years, partly as the result of increased cost of labour and building materials. In connection with this subject, Dr. Parsons sets out the suggestions made by the Local Government Board for reducing the cost. It does not appear, however, that the advantages in respect of cost by the construction of temporary buildings is as great as would appear when all the circumstances are considered. Cost is of course necessarily dependent on design and it is here Dr. Parson's report will be of especial value to sanitary authorities desiring to avoid unnecessary expenditure when considering the requirements of their districts.

The report is a useful supplement to that of Sir Richard Thorne, and it provides in every way the information which is needed at the present time.

There were several other instances where members of the same family were infected, and, while there was found no case of spread of the disease in school, one could not but conclude that the intimate relations of family life are more conducive to its spread in the homes.

That the high percentage of children affected with ringworm in the infants' departments was not exceptional seemed to be borne out by an examination of 77 entrants to the infants' department of one of the schools. Among these five cases of ringworm were found, giving a percentage of 6.5 affected. Here almost certainly the source of infection was in the home.

School Medical Inspection throughout the whole West Riding showed that during 1910, 1.74 per cent. of the children examined in the

HEALTH WORK IN NEW YORK, U.S.

MOVING PICTURE TUBERCULOSIS EXHIBITIONS.

For a number of years the Department of Health has given stereopticon tuberculosis exhibitions at night during the summer months in the public parks of the city. In 1911, the Tuberculosis Committee of the Charity Organization Society assisted in this work by furnishing a lecturer for a number of the exhibitions. But the lectures proved unsuccessful, the conditions being so poorly adapted for public speaking. Such audiences must be instructed by being interested and amused. During 1912, therefore, moving pictures are being given in place of the lectures, five of the best "tuberculosis" and "health" films being used, accompanied by the usual stereopticon views. Although the cost has been materially increased, yet the results in the form of increased attendance, and wider dissemination of information to the public, justify the expenditure. The Tuberculosis Committee of the Charity Organization Society has actively assisted the Department of Health in this work, selecting the films, and supervising the exhibitions. Handbills announcing each exhibition are distributed by the tuberculosis nurses of the department throughout the district surrounding the park, and notices are also posted in the park itself. The exhibitions begin at 8 p.m.

THE RESPONSIBILITY OF PHYSICIANS AND MIDWIVES IN THE REPORTING OF BIRTHS.

The Commissioner of Health, Ernst J. Lederle, Ph.D., calls attention to the fact that the number of births recorded in New York City during the past five months of 1912 was 56,258 as against 56,082 for the corresponding period of 1911. This rate would indicate a decrease of 0.3 per cent. (inheritance). By Prof. Pearson (Unlau

There were eight cases when the affected children were permitted to attend school. Of these eight three were cured before the beginning of June; but in the meantime three other ringworm cases were admitted, two being from the infants' department and one from outside the area, keeping the number affected at eight, as at the beginning. When last seen by me most of the cases were greatly improved, some indeed showing but small areas affected with the disease.

No child became freshly infected with ringworm of the head during the progress of the experiment, all the new cases being the three admitted. A few children were found with ringworm on other parts of the body, the source of infection being unknown. Such presented no difficulty, as the headmaster cured them simply by applying a little iodine solution.

While, on the other hand, the infant death rate of those under one year of age has remained stationary. If the decline in the rate were dependent upon natural causes, it would be accompanied by a decrease in the number of children dying under one year of age, but we find in the Borough of Brooklyn that the number of deaths of such infants in 1912 exceeded those in 1911 by 43. Moreover, the number of marriages reported in 1911 was 48,765, an increase of 2,348 over those of 1910.

From these figures it would seem to be evident that the decline in the birthrate is due to the fact that physicians and midwives have, in many instances, failed to report births.

PREVENTION OF INFANT MORTALITY.

An offer from the Committee for the Reduction of Infant Mortality of the New York Milk Committee, to render valuable assistance to the Department of Health in the conduct of the work of the infants' milk stations, has been accepted by the Department of Health. Under the plan of co-operation which has been arranged, the medical members of the Committee for the Reduction of Infant Mortality will visit the Municipal Infants' Milk Stations from time to time and make reports to the Department in regard to the conduct of the work, and will submit suggestions for such improvements in methods.

The Committee will also render active assistance in supervising and checking the records of the milk stations, and collecting data for the purpose of reports and public statements. It will assign one or more persons capable of doing this statistical work, and will actively co-operate with the Department in the accumulation of useful and accurate data for the purpose of improved control of the work and the promotion of the highest efficiency.

The New York Milk Committee has already provided an Executive Secretary for the recently-established Babies' Welfare Association, the object of which is to bring about the highest possible degree of co-operation between private agencies and the Health Department in the work of reducing infant mortality. In addition to the services rendered by this Executive Secretary, the Committee will further assist the Department of Health in preparing material for publication, and in carrying out plans for public meetings and exhibits of an educational nature.

THE LATE DR. DONALD CAMPBELL, of Lornecliffe, Calne, Wilts., medical officer of health for the Calne Rural and Urban District and Union, left estate of the gross value of £11,885.

PRECAUTIONS TO BE TAKEN AGAINST ENTERIC FEVER.

THE pamphlet of "Advice to medical men touching enteric fever and diarrhoea," published in 1904 by the Imperial Health Office of Germany, has been brought up-to-date and republished. The following is a summary of the contents of the seven paragraphs:—

(1). Immediate notification of suspicious cases of enteric (typhoid) fever and infective diarrhoea is recommended, and in case of death precautions are to be taken to prevent the spread of infection pending a final diagnosis being made;

(2). The same precautions are to be taken in suspected as in actual ones;

(3). Method of spread of these diseases are described, viz., by (a) contact, (b) clothes and eating and drinking utensils, (c) food, (d) water, (e) flies, and (f) convalescents and carriers;

(4). Confirmation of diagnosis by the Widal reaction, search for the bacillus in the blood (when 1 to 2 cc. blood are necessary), by examination of stools. In suspected cases importance is attached to the early examination of specimens of blood and stools, and if negative results are obtained two or more specimens are to be submitted;

(5). Contains details as to sending specimens;

(6). Patients are to be isolated at home or in a hospital, and in either case to be placed if possible under the care of professional nurses. The cases are to be sent to hospitals when occurring in hotels, children's homes, nursing institutions, prisons, schools, or similar institutions, also on premises where milk, vegetable, or any other food business is carried on, or on board ship, and generally when the presence of the patient in the home is a source of danger to the other inmates of the house (e.g., because of dirt, want of proper nursing, presence of a number of children). Ten days after the temperature has fallen to the normal, a sample of the stools and, in the case of enteric fever, of the urine should be sent to the Bacteriological Institute, and at subsequent weekly intervals. The patient may be discharged after two or three examinations with negative results, but in the case of enteric fever the patient may be discharged in any case at the end of 10 weeks from the beginning of the illness, and, if the *B. typhosus* be still found, the precautions suitable to a carrier are to be taken;

(7). The relatives should be specially warned by a leaflet how to avoid infection, special attention being paid to cleanliness in taking food.

For disinfection of stools, &c., the following are recommended: (1.) Solution of cresol water (2.5 per cent.). (2.) Milk of lime. (3.) Milk of chloride of lime.

NOTE.—Veröffentlichungen des Kaiserlichen Gesundheitsamts.

There are so many differences between the sanitary legislation of Scotland and that of England and Wales that it seems unfortunate to attempt to set both before a student in the manner followed here, viz., a disjointed stenographic phraseology. From the wording of the headings to Regulations re offices of medical officer of health and sanitary inspector (pp. 5 and 10) it might be understood that the Local Government Board of England and Wales have issued only "Draft Regulations" touching those offices which are to be adopted by local sanitary authorities—as the Local Government Board of Scotland appears to have done. In this part of Great Britain, the Orders are mandatory. We fear the book is too near the level of a 'cram.'

THE LOCAL INCIDENCE OF CANCER. By C. E. Green, F.R.S.E. Edinburgh and London, Wm. Green & Sons, 1912. pp. 36.

The author adduces a mass of figures and quotations in support of two contentions, viz., (a) that "towns lying in a hollow have by far the highest cancer mortalities, while those on a level site with level surroundings, show the lowest percentage. Those on hilly sites are slightly higher than those on sloping sites," and (b) that "when there are no chimneys and where no coal is burned cancer is almost unknown." We are unable to form any opinion of the value of the quotations as we have neither opportunity nor time for examining them in their context. Of the figures adduced we desire to say that one most important factor has been left entirely out of consideration, namely, the variations in age constitution of the populations of the cities, towns, etc., taken for illustration. Cancer being almost exclusively a disease of old age—or late adult life—it is evidently quite fallacious to compare the all age mortalities of two districts (say X. and Y.) from cancer, or the percentage ratio of cancer deaths to all deaths. Adjustments require to be made for the differences in proportions of elderly and old people—and for females.—The author's first table, cancer in the registration areas of London, is absolutely misleading for this reason, and has the further defect that no corrections have been made for deaths in hospitals.

TUBERCULOSIS IN FLORENCE. A reprint of the communication—*La Mortalità per Tuberculosi a Firenze nel quinquennio 1907-1911*—which was presented by Prof. Ugo Giusti to the International Congress at Rome in April last, has been issued by the Statistical Bureau of Florence. The booklet might well serve as model for those desiring to submit a complete report on the prevalence and behaviour of the disease in their districts. After a general survey of the mortality

and towns of Italy and the principal cities of Europe, the author discusses the causality in Florence, giving tables of mortality at different ages among the two sexes, and according to occupation. Diagrams are included showing how the mortality varies in the different "statistical areas" (*zone statistiche*) into which the City is divided.

Prof. Giusti concludes that the mortality from all forms of tuberculosis in Florence shows indications of increasing after having decreased for something like twenty years dating from 1882.

AN exceedingly interesting and valuable report—*Il Comune di Firenze e la sua Popolazione al 10 Giugno, 1911*—has been issued by the City's Statistical Bureau setting out the results of the National Census (January, 1911) and those of an industrial census conducted by the Municipality (June, 1911). We should welcome similar volumes for all the more important cities and towns of this country.

THE SCHOOL AND INFECTIOUS DISEASES.—The school as a factor in the spread of infectious diseases, and in the control of epidemics, has always been a problem for health authorities. While it is acknowledged that, owing to the crowding into schools of great numbers of children at an age when they are particularly susceptible to these diseases, the schools play a very important part in the spread of epidemics, it has, on the other hand, been more and more recognised that this is only one, though an important, contributory factor. Hence arises the necessity not only of dealing with the school building (by disinfection and cleansing), and with the individual child (the carrier), but also with home conditions and associates; and, therefore, some definite uniform working basis for the combined attack of all bodies controlling public health. The Board of Public Health and the Education Department here must work in conjunction if effectual control is to be established.

With this object, we have consulted the Board of Public Health, and arranged with them a scheme for the combined attack by health officers, teachers, and school medical officers on these infectious diseases in the school and in the home. Especial attention has been paid to the diphtheria carrier and to the control of measles, and the result will be a more uniform method, after less frequent resort to closing schools.

Much of this is in anticipation of the Health Act, and is looked for alteration of the Health Act, and to meet with present day requirements and needs. A set of circulars to parents dealing with teeth and other defects is one of our plans for the coming year.—*Education Report, 1912, V*

PUBLIC HEALTH.

OBITUARY.

THE LATE DR. JOHN KNIGHT, OF SCARBOROUGH.

THE death took place on September 16th of Dr. John Knight, who for the last seven years had been the medical officer of health at Scarborough.

Two months ago Dr. Knight was operated on for malignant disease at Scarborough, and was granted three months' leave of absence by the Corporation. He went to Uddingston, near Glasgow, where his death took place, as stated, in his 38th year.

Dr. Knight was a native of Glasgow, and leaves a widow and two children.

Dr. Knight was appointed medical officer of health for Scarborough on the 20th of January, 1902, and he had resided at 9, Trinity Road, Scarborough.

His qualifications were M.D., Glasgow, 1902, B.C.M. 1896, D.P.H.Camb. 1898 (University of Glasgow). In addition to being medical officer of health for Scarborough, he was the school medical officer and superintendent of the fever and small-pox hospital. He was the third successive Scotchman appointed by the Scarborough Corporation as medical officer of health, his predecessors having been Dr. Dittmar and Dr. Littlejohn. He was a most promising member of the medical profession, and it had been proclaimed of him that he would rise high in his profession. Since coming to Scarborough, he had carried out many schemes for the physical improvement of the inhabitants. He interested himself greatly in the question of the infantile mortality. He originated the idea of lady health visitors, and the formation of the classes for mothers, and the annual baby show, were due to his interest in this class of work. He was an authority on small-pox, and in 1904 he read a paper on "The Control of Small-pox Contacts" before the members of the Royal Sanitary Institute. In 1902 he wrote an article on the rôle of the "Reception House in Infectious Diseases," which appeared in the *Glasgow Medical Journal*, 1902. In July, 1896, he graduated at Glasgow University with honours, and at the same time gained the Brunton Memorial Prize awarded to the most distinguished graduate of the year in medicine. In the summer of 1897 he began a course of laboratory work in public health under Professor Gaister, and in January, 1898, was appointed pupil assistant to the medical officers of health for Glasgow. Under the late Dr. J. B. Russell and Dr. A. K. Chalmers, he obtained a thorough acquaintance with the duties of a medical officer of health. In April, 1898, he was appointed assistant to the chair of Forensic Medicine of Public Health, Glasgow University, and in October of the same year obtained the Diploma in Public Health of the Cambridge University, whilst during 1898-99 he

held a successful lectureship in hygiene at the High School, Glasgow. These posts were resigned in the autumn of 1899, in order that he might become more thoroughly conversant with the diagnosis, treatment, and administration of infectious disease on a large scale as Assistant-Physician in Belvidere Fever Hospital. In June, 1900, he was appointed assistant medical officer of health for Glasgow. His experience of infectious diseases prior to coming to Scarborough was extensive and varied. At Glasgow he went through several large epidemics of small-pox, two outbreaks of bubonic plague, typhus fever, beri-beri, anthrax, and glanders. In August, 1903, he discovered an outbreak of enteric fever, associated with shell-fish, and was appointed special commissioner by the Local Government Board to investigate and report on it.

Dr. Knight was a Fellow of the Society of Medical Officers of Health, and a member of the Royal Sanitary Institute.

PLAGUE ON THE TYNE.—The Local Government Board reports that an imported case of human plague has occurred on board a vessel in the River Tyne Port Sanitary District. The patient was an apprentice on board the ss. *Bellaisa*, which arrived in the River Tyne from Hamburg on the morning of September 10. Later in the day the boy was taken ill, and was removed to the floating hospital as a case of typhoid fever. On the following day the Port medical officer of health suspected the case to be plague, and a sample of the patient's blood was taken for examination. On September 13 the bacteriologist at the College of Medicine, Newcastle, reported that cultures from the material showed colonies resembling "B. pestis," and further samples of blood were taken. The boy died on September 16, and on September 18 a post-mortem examination was made by the Port medical officer of health and further material obtained for examination. The diagnosis of the case as one of plague has been confirmed at the Board's laboratory. An apprentice from the ss. *Bellaisa* was taken ill before the vessel left Hamburg, and died there on September 4. Another fell ill off Cuxhaven, and is in hospital at that port. It is reported that both patients were suffering from plague.

THE HAIR.—In connection with the work in the schools, difficulties have cropped up with regard to the attitude towards the presence of nits in the hair. These have been obviated by the printing of 50,000 copies of a circular of information to parents on the care of the hair, and the best method of cleaning it thoroughly. These circulars are distributed to all mothers, without distinction, so that they may be able to understand the condition, and thus be better able to cope with a fresh infection.

—*Education Report, 1912, Victoria.*

THE ANNUAL DINNER.

THE Annual Dinner of the Society took place at the Waldorf Hotel, Aldwych, the president and Mrs. E. W. Hope receiving the guests in the Palm Gardens.

The Chair was occupied by the President, and among those present were: The Lord Mayor of London and the Lady Mayoress, the Lord Mayor of Liverpool (the Earl of Derby), Sir Thos Barlow (President of the Royal College of Physicians), Sir Lauder Brunton, Sir Robert Morant, K.C.B. (Chairman of the Insurance Commissioners of England), Sir Jas. and Lady Barr, Sir W. H. Lever, Bart., the Hon. J. L. Griffiths (American Consul-General, Liverpool), Sir Victor Horsley, Col. Kyffin-Taylor, M.P., F. C. Willis, Esq. (Assistant-Secretary Local Government Board), the Town Clerk of Liverpool, Dr. Smith-Whittaker. The Vice-Chairs were filled by Drs. Allan, Butler, Dudfield, Herbert Jones, Priestley and Willoughby. Many ladies were present, the guests numbering over a hundred.

The following guests regretted their inability to be present: The Rt. Hon. John Burns, the Lord Bishop of Hereford and Mrs. Percival, Sir Ronald Ross, Sir Wm. Osler, Sir John MacFadyen, Sir Arthur and Lady Whitelegge, the Archdeacon of London, Commander J. C. Pereira Tinto, Sir James Crichton Brown and Lady Crichton Brown, Sir George Newman, Dr. and Mrs. Newsholme, Dr. and Mrs. Tatham, and Prof. Sims Woodhead.

The Royal Toasts having been duly drunk with all honours—

THE PRESIDENT, in proposing the toast of "Our Guests," congratulated the Society on the support which they received from persons eminent not in medicine or science only, but in law, commerce, and statesmanship, without which the objects which they had in view would be much more difficult of accomplishment. As education in public health matters extended in every direction, there was no doubt that the duty of the sanitarian became easier; the neutral ground on which it was working extended to the duties not only of rulers of cities, but of statesmen. These were simplified if the people understood the objects of the work which was being undertaken on their behalf. All of them had familiar instances in their various cities and towns of councillors who had served their districts actively and well, and had accomplished a great deal in the promotion of public health, but at the end of a few years these services were rewarded by their being sent about their business at the polls. If there was one thing that an official disliked more than another it was change. No sooner had councillors become familiar with the duties that they had undertaken to perform than an indiscriminating

public rejected them. The remedy for that was the education of the public, and that education in public health matters was growing every day.

There was a time, thirty or more years ago, when no student could anywhere obtain the necessary course of education in public health matters. The University of Edinburgh was the pioneer in giving such a course and granting a public health degree. Later the University of Cambridge recognised the importance of the subject, followed by that of Dublin; and at the present time there was not a single university in the British Isles which did not afford facilities for the teaching and giving, after examination, of degrees in public health. But that was not enough. They must go up and down the scale. They must teach all people who were affected that instruction in matters of public health was necessary and helpful all the time. The example led by Germany ought to be followed. In that country there was not a university or place of public instruction in which this subject was not taught in a way that attracted the people. It was useless to present it in an unattractive form. They might as well try to teach children archæology by showing them ancient tombs in the British Museum. They ought to copy Germany in the marvellous exhibition which they had established in Dresden, and which had been visited by millions of people. Theirs was a subject which provided a neutral ground on which the views of all might harmonise. That night they were particularly fortunate by having amongst their guests statesmen and others who were united in the one desire for advancing public health, though they might have different views on other matters.

They were honoured with the presence of ladies, and that reminded them of the large and ever-enlarging sphere of women's work in the prevention as well as in the alleviation of disease. They had the honour of welcoming the Earl of Derby, to whose powerful influence the progress of sanitation owed so much and who had worked in so many directions to advance the national welfare in regard to public health. It seemed to him to be a happy augury that they also welcomed two old friends—Sir James Barr, President of the British Medical Association, to whom they extended their sympathy in the severe strain to which his conciliatory and pacific instincts had recently been subjected, and Sir Robert Morant, best known to them in connection with the launching of that beneficent scheme of medical inspection of school children. Now Sir Robert was in another sphere, as Chairman of the Insurance Commissioners, of which they did not know quite so much; but probably they would know a little later on. Then they were honoured by the presence of Mr. F. C. Willis, from the Local Government Board. They always recognised how anxious he was to help them and

do exactly what they wanted when that harmonised with what he thought they ought to want; Sir Lauder Brunton; Sir Victor Horsley; Sir Wm. H. Lever, whose beautiful Sunlight village was a pattern for adoption by every great growing city in establishing ranges of bright Sunlights around it; Prof. Harvey Littlejohn and others.

He wished to associate this toast with the names of two distinguished guests: first, that of Sir T. Crosby, the present holder of the time-honoured office of Lord Mayor of London. He knew of no title which blended together so much of historic interest, of commercial enterprise and greatness, of dignity and of romance as that of the Lord Mayor of London. He thought he was right in saying that the present holder of that distinguished title was the first medical man who had ever attained to that eminent office. The other guest with whom he desired to associate the toast was the Hon. J. L. Griffiths, American Consul-General. Attracted, no doubt, by this banquet, Mr. Griffiths had curtailed a holiday on the Continent, and exchanged the sunny delights of Italian scenery for the rather less attractive atmospheric conditions of a London fog. Mr. Griffiths represented a body of officials of extreme importance to sanitarians. The consular body had two functions which they could appreciate. One was to inform their respective Governments of the sanitary condition of the places in which they lived; and the medical officers of health had always to have an eye on the consuls, because if they could keep them in a satisfactory frame of mind, they would satisfy their own Governments. The chief function of a consul, however, appeared to be to satisfy the apprehensions and allay the anxieties of the timorous hearts of his fellow-countrymen—if there were any amongst Mr. Griffiths' fellow-countrymen who possessed hearts of that character—as to the condition of the port in which he was stationed, and to that end to possess himself of the fullest and most complete information. They knew how the American Consul-General had taken the deepest interest in the ports of this country, and in the absence of any other reason he should welcome Mr. Griffiths as a colleague to the medical inspector of one of the largest of British ports. Possibly the only barrier that stood in the way was that he was not a medical man!

He assured the guests on behalf of the Society of a most cordial welcome, while, on the other hand, they appreciated the honour they had done the Society by their presence.

THE LORD MAYOR OF LONDON said he felt honoured by being called upon to return thanks for so distinguished a body of guests as were there present and for those who would have been present had they not been prevented. Anyone out

of a list of the dozen or so names mentioned would have been better able to have done full justice to the toast than even a live Lord Mayor of London, although he was a medical man. He had listened with great pleasure to the President speaking of their Society as a medical sanitary body. A most important body it was, and he had accepted with very great pleasure the invitation sent to him, and to the Lady Mayoress. They had given them a hearty welcome at the reception and excellent entertainment at dinner, surrounded by one of the greatest adjuncts of a pleasant evening—the society of ladies. He wished that that custom were more common than it was at the numberless dinners he had to attend.

He was happy in having associated with him one of the best post-prandial orators, who was far more capable than himself of finding that language which seemed to grow from contact with the two great oceans of the Atlantic and Pacific. At any rate, America had sent to this country the best rhetoricians and orators that he had ever listened to.

He acknowledged that he was the first Lord Mayor of London who was a medical man, and he confessed that if he had not been a medical man he should not have undertaken the duties of his onerous position. After very carefully considering the offer of the dignity, he thought that at his advanced years he would not be able to do what was fair and right by accepting the offer. Happily he had enjoyed great good health, and had done his duties. But he should not have accepted the office had not a learned friend connected with the Guildhall Library, who had made a search into the history of the 756 Lord Mayors of London, written to him, saying that there was no evidence whatever that any one of those Lord Mayors had been in any way connected with the medical profession. Then he thought to himself that he would be Lord Mayor and show to his fellow-countrymen—from the highest to the lowest in the land—that a medical man could not only attend at the bedside of the suffering, relieve sickness and pain, but sit in the Councils of the greatest City the world had ever seen.

THE HON. J. L. GRIFFITHS said it was always difficult to respond in any adequate manner to the toast of the guests, and this difficulty was greatly enhanced when the response followed immediately the toast of the King, instead of in its usual modest place in the programme, late in the evening, when old stories could be told with some presentment of freshness to a jaded audience which had neither the inclination nor the capacity for acute criticism. Such was not the case when one was asked to deliver an address to an audience so abnormally alert as this, and with the instructive eloquence expected of the speaker. It was needless to say that those

who had been fortunate enough to be invited as guests had a very keen appreciation of the charming hospitality, and that they looked with the highest favour upon their hosts as guarantors that whatsoever had been served, had been digestible as well as delicious.

It was always difficult to approach the serious consideration of any social question after one had been luxuriating in a Continental holiday. There were three considerations about which he wished to say something that evening. He believed, in the first place, that national health was the greatest of national assets, and that the men who were successfully fighting disease in their great cities were deserving of the support of all good citizens. He thought it might be said that they need not be apprehensive of any epidemic of serious proportions in England or America. The medical officers of health, especially those stationed at commanding ports, were exercising such rigid vigilance and instituting such effective quarantine that the plagues in China or India could not invade any European capital. He had come there that night because the President of their Association came from Liverpool, a place where he had spent four and a-half of the most delightful years of his life. It was a city not only of cotton and shipping industry, but of culture, refinement and hospitality—a city which, by its School of Medicine, had done as much as, if not more than, any other in the United Kingdom in dealing in a scientific way with certain diseases which had made so heavy a toll on the human race for years. He knew something of what that school owed its success to Sir Alfred Jones and Sir Wm. H. Lever. The third reason, which was the principle reason, was the fact that the President of this Association had been a personal friend of his for many years. He had known of the professional self-sacrificing way in which that gentleman had carried on his work; of his keen efficiency and splendid courage; and he would always remain the ideal of a faithful public servant. They were sometimes inclined to compare the period in which they lived with the great books written, the great pictures painted, the glorious cathedrals built by former generations; but they must not forget that the task was differentiated by the regard of their fellow men. The thought that ran through the twentieth century as to public service and honours was that the voice of conscience was still heard and was realised as never before. The secret was that as medical officers of health they were indeed their brother's keeper. And so they had not only societies for the prevention of cruelty but for the encouragement of kindness to animals and children, homes for the aged and infirm, open spaces for the recreation of little ones, hospitals where the very poor received the same course of

treatment for which the more well-to-do had to pay large sums. Instruction was given to mothers how to bring up their offspring. The time was, but no longer, when a mother, on being remonstrated with as to the treatment of her children, would reply, "Don't talk to me about how to bring up my children! I ought to know, for I have buried eleven!" Nor was it any longer possible for a hospital doctor to say to an attendant nurse, "How many patients died in the night?" and the attendant to answer "Eleven." "Why," the doctor would say, "I left prescriptions for twelve"; to which she replied, "I forgot to give one." Best of all, the slums were being gradually eliminated from our cities. They who were associated with this problem of saving human life had done more than had ever been done in the history of the world. Nothing which his own country had achieved deserved greater praise than the wiping out of yellow fever in Manilla and the conversion of the Panama Canal from the breeding-place of disease and the very abode of death into such a happy, habitable location that it might in the near future become a popular health resort. Believing as he did that the life of a baby was infinitely more worth saving than a masterpiece—it seemed that the production of masterpieces at the present time was somewhat restricted, though the supply of the others was overwhelming—and knowing something of the benevolent work that the medical officers of health were doing in insisting on the necessity of wholesome, pure food, and proper sanitation to prevent the waste of human life that had been going on through the ages—he trusted that their hosts would be furnished with every facility for carrying on their good work, and that they would be strengthened to see that neither the greed of landlords nor the selfish interests of those who were willing to make a profit out of the food of the people, would prevent such a social transformation that none should be underfed, or—he spoke with a good deal of feeling—that no one should be overfed, and that no child should be born mortgaged in the womb to a life of sorrow, misery and crime.

The EARL OF DERBY, in proposing "The Public Health Services," after a humorous reference to the amusing and eloquent speech of the American Consul-General, said that there was no doubt that in the history of the world, the greatest advances had been made during the last few years in medical science and the application of it to the general health of the country. Dr. Hope had told him that if the rate of death per thousand that existed fifteen years ago existed now, a million people who were now alive in England would have been dead. He should have waxed enthusiastic over that statement could he have been quite certain that some of those whom he could bear to part with were

included in that million. If medical science could advance further, and say why these men were saved, he would gladly co-operate. But, joking aside, apart from the saving of life, the medical officers of health had done much for the welfare of the world in other ways, and more especially in seaport towns like Liverpool. In the old days of quarantine, nobody could realise nowadays what were the hardships experienced by those on board ship when a vessel was placed in quarantine, or even with what suspicion a ship was regarded which had come from a foreign port after quarantine had been removed. Now, thanks to the medical officers of health, in seaport and other towns they had a standardisation of health interwoven into international agreements, which compelled every city to prove its case, and keep its health to a specific line. That meant, when a ship went into quarantine, as before, the passengers and crew were at the present moment treated as if in their own homes, looked after and supervised as if they were trying to prevent an epidemic itself. The medical officers of health were doing for the world at large what they would do for their own particular city. He had been told—and he was certain that it was so—that the most cordial relations existed between their Society and the Local Government Board. Well, that was as it should be. It was exactly like a wise father and his son. If the father and son treated each other with confidence, then everything went well; and so it ought to be between the Local Government Board and those who were doing their work in their various cities. Of course, medical officers of health were having every day more duties put upon them, and he thought the time would come when a stop would have to be put on the amount of work for national purposes placed upon local officers. Some system would have to be inaugurated by which there would have to be a larger system of national service among medical officers of health than now existed. The Insurance Act was bringing in some of its rich and ripe fruit in the way of the medical officers of health. He was certain that they would not work against anything that the country said was to be the law, and the only thing that prevented them from so doing was that the physical power of carrying on the enormous amount of work put upon them would become almost impossible. He asked the company to drink to the health of their noble selves, coupling the toast with the name of Sir Robert Morant. But before doing so, as occupying the position of Lord Mayor of Liverpool, he wished to recognise, because nobody knew it better, all that Dr. Hope had done for that city: and when the Society of Medical Officers of Health honoured Dr. Hope by making him their President, they at the same time honoured themselves. Sir Robert Morant was an old friend of his. He

had known him for many years, and in many capacities. He was not quite sure in what capacity he coupled Sir Robert's name with the toast—whether for his great work in the past, or for the nature of the work he was going to do in the future. At any rate, he coupled the toast with the name of a man who had given sterling work to the State, who had never spared himself, and had always done what was right and just.

SIR ROBERT MORANT said that the toast should have been replied to by the President of the Local Government Board, who had been unable to be present on account of the fog. In place of a man whose metier was public speaking, the duty had been palmed off on a civil servant whose last business in the world was not to speak at all. That was not his fault, but his misfortune. He went on briefly to suggest that the influence of public officers of health on the health of the community might extend in time to the individual, and to express the hope that he might call upon the members of the Society for tactful co-operation with the Insurance Commissioners.

PROFESSOR A. BOSTOCK HILL proposed "Kindred Societies," a new toast on their list which he felt it a great honour to submit. They were entitled, for that evening at any rate, to consider the Royal College of Physicians and the Liverpool School of Tropical Medicine as kindred societies, because representatives of those important bodies were down on the list to reply to the toast. They might also rightly and properly consider the British Medical Association, whose President they were peculiarly gratified to see that night, as a kindred society. Speaking as one of the senior medical officers of health in the country, he thought that the solution of existing difficulties between the preventive branch of the medical profession and the members of the British Medical Association might be accomplished by friendly conferences. The Royal College of Physicians was looked up to as the embodiment of all that was highest in British medicine, and he voiced universal sentiment when he said that Sir Thomas Barlow occupied a position second to none, not only in Britain, but in the medical world generally. He also coupled with the toast the name of Sir Wm. H. Lever, President of the Liverpool School of Tropical Medicine, whose researches had made possible the great work now near completion, the Panama Canal, had rendered many parts of the earth's surface pleasant dwelling places instead of plague spots, and had given every opportunity for the expansion of the Empire.

SIR THOMAS BARLOW said he was honoured in being associated with Sir Wm. Lever, in responding to the toast of "Kindred Societies." He supposed that the word "kindred" led the imagination of every doctor far beyond every society, and made them think of the solidarity of medicine as

a profession whose one great aim was to improve the health of mankind, whether looked at from the point of view of the community or of the individual. They all knew that the consideration of the problem of modern civilisation brought about what one grumbled at sadly—the growth of specialism. It was inevitable that specialism should bring with it a great many difficulties and troubles which had to be faced. The specialist was apt to think that the destiny of the whole human race, and even of the universe, turned round on his particular study. One of the effects of meetings of members of various medical societies was that a man became not so contented with his own special method of treating illnesses; he learned what his neighbour who had been working in other departments had been thinking about it. He maintained that the medical man could learn more in a year by listening to those who were working in other departments, and by the common interchange of knowledge, than by confining themselves to those who had been working at the same line of practice and investigation. The one society they were interested in that evening was the Society of Medical Officers of Public Health. He rejoiced that it was so prosperous was spreading its arms over a wider area, accomplishing so much good; and that there was a more cordial co-operation between the general practitioners and the medical officers of health. It had been a great distress to him to hear of so much antagonism between these two members of the same profession, and he was glad at the wise and humane words which had fallen from Sir Robert Morant. He looked forward with delight to the future when the Insurance Act was got into real working order, when there would be co-operation between this Society and the general practitioners, and when this pitiable antagonism which had been maintained in the time gone by, and which had been so distressing to the community would disappear. He hoped his words would be taken in the sense he meant them, and that a good example would be shown by a real desire to co-operate and join in helping forward not only the effort to cure, but to prevent disease. He thought the Society was trying to do that, and he wished it the greatest possible prosperity.

SIR WM. H. LEVER, in acknowledging the toast, said in inviting him to be present that evening, he had no doubt the Society also wished to show their appreciation of the great work which Sir Alfred Jones had accomplished in establishing the Liverpool School of Tropical Medicine. He himself was specially proud to have taken part in that work, and that their President, Dr. Hope, was on the committee, of which he was chairman. He was glad to think that all the "kindred societies" were "approved societies." With

good sense, good faith, and sound judgment on the part of every Englishman, Scotsman, and Irishman, a solution would be found of all the difficulties which would enable the good work of the care of the sick to be accomplished with success. He felt that the greatest work which the members of the Society had done was to take away the mystery about disease. He remembered it used to be thought that it was an absolute condition of child life that their infantile progeny must have certain ailments: that children could not survive to adult life unless they had had the measles or whooping-cough. They were now taught that that was not necessary. It was just as true that the diameter of a circle always bore the same uniform relation to the circumference as that given certain conditions of sanitation, certain conditions where contagion could spread, it was equally certain that you would have corresponding disease. The members of the Society of Medical Officers of Health had exploded the idea that there was any necessity to have these diseases. They had shown that the science of medicine was as exact as the science of engineering; that disease could be produced or prevented; that the length of men's lives could be increased; that homes could be made what they ought to be—gardens and bowers, in which young and healthy lives could grow up, increasing in strength, and imparting power to the whole nation. They had brought happiness to the whole human race by increasing the health of the human race. They had shown that only given certain conditions, they could guarantee certain health to the city, the country, and the world. The grandest work begun in the last half of the nineteenth century, and to be accomplished in the first half of the twentieth, concerned public health. Contrary to the rules that prevailed in other businesses which provided that the more you developed your business, the more expert you became in it, the more you increased it, the more your customers increased, the more the members of this Society became expert in their business, the more the health of the towns and villages would increase, the fewer the patients they would have! He was told that a Chinaman paid his doctor as long as he was well, but as soon as he became a patient his payments ceased. The only way in which future members of their Society could make a living was by imitating the Chinaman, for whose system of payment a great deal was to be said. He again thanked the Society for having included the Liverpool School of Tropical Medicine amongst "kindred societies," and whatever feeble efforts he could put forth to aid in making the tropical parts of the world as healthy as the temperate climates, he would gladly see statement

SIR JAMES BARR proposed that some of President. It was a good deal to part with were his old friend (should be)

Society of Medical Officers of Health, and he had great pleasure at being there that evening as head of the British Medical Association.

The toast was enthusiastically honoured, and the President having briefly replied, the proceedings concluded by singing "Auld Lang Syne" and the National Anthem.

During the evening a number of songs were delightfully rendered by Miss Violet Elliot, Miss Fanny Wood, and Mr. Conway Dixon, and some stories, new and old, told with great effect by Mr. Fred Upton.

Scottish Branch.—A Meeting of the Scottish Branch was held in the Station Hotel, Perth, on Saturday, September 21st, 1912.

Present:—Dr. Maxwell Williamson (President, in the chair), Drs. Wilson, Templeman, Chalmers, McNaughton, Mathew Hay, Cragnell, Bruce, Graham, Munro, Dewar, Gilmour, McWhan, Douglas, Kidd, Robb, Trotter, Jack, Hamilton, J. A. Macdonald, G. G. Buchanan (Secretary).

The minutes of the last meeting were read and approved. Apologies for absence were intimated from Drs. C. R. Macdonald, Mackay, McVail, Currie, Nasmyth, Maxwell Ross, and Miller.

The President, in a few words, thanked the members for the honour they had done him in electing him as President of the Branch, and referred to the valuable work done for the Society by the late president, Dr. Wilson.

The meeting then proceeded to consider the Public Health Pulmonary Tuberculosis Regulations, 1912, with reference to the form of the notification certificate, and the method of obtaining any additional information required about the cases.

A full discussion followed, and several of the members described the method they adopted to get full information.

It was found that the methods varied considerably. The general opinion was expressed that in future the information required would be got by the tuberculosis officer.

Sanatorium benefit was next discussed, and the medical Forms II. and IV. issued by the National Health Insurance Commissioners were considered. The question as to the necessity of obtaining information on Form II. in every case gave rise to a long discussion, at the conclusion of which Dr. Mathew Hay moved:—"That in the opinion of the Society of Medical Officers of Health (Scottish Branch) an initial clinical report by the medical attendant is not necessary in every tubercular case, and that its requirement should rest with the Insurance Committee."

The motion was seconded by Dr. Wilson.

Dr. Williamson was of opinion that it was advisable in every case to get a report from the

medical attendant. He therefore moved the previous question, which was seconded by Dr. Douglas.

On a vote being taken, the motion was carried.

The tuberculosis officer's appointments were then considered.

The feeling of the meeting was that all cases of phthisis would require to be dealt with by the local authority whether they were insured persons or not. The tuberculosis officer should be an officer of the Public Health Department, but there was not sufficient time to allow of a full discussion.

The form of the suggested Parliamentary Return, giving the salaries and duties of medical officers of health, was considered, and a number of amendments on the draft form before the meeting were suggested.

The meeting then terminated, the President intimating that it was proposed to hold the next meeting of the Branch at the City Fever Hospital, Edinburgh, on a date to be afterwards arranged.

Midland Branch.—A meeting of this Branch was held on Thursday, October 3rd, 1912, at 3.30 p.m., at the Council House, Birmingham.

Present:—Dr. Henry Handford (in the Chair), Drs. A. Bostock Hill, J. Doig McCrindle, Mabyn Read, G. Petgrave Johnson, W. Garman, W. Lewis Thomson, R. W. H. Jackson, J. King Patrick, J. Orton, C. E. Tangye, T. Shadick Higgins, H. Gibbons Ward, J. M. Cowie, A. J. Jenner, A. S. Underhill, John Dale, A. Hamilton Wood, W. H. Davison, T. Ridley Bailey, Henry May, J. A. Codd, H. Gordon Smith, George Reid, E. H. Snell and others.

An apology for non-attendance was received from Dr. J. Robertson.

The minutes of the last meeting were read and confirmed.

Dr. Handford inducted his successor, Dr. J. Doig McCrindle into the chair. Dr. McCrindle, after a few words of thanks to the Branch for electing him to the position, proposed a vote of thanks to Dr. Handford for his services to the Branch during the past year.

Dr. Bostock Hill presented his report as Treasurer. After being audited this was received and adopted.

The President, Dr. McCrindle, delivered an address in which he dealt with the questions of Tuberculosis and Sanatoria.* Dr. Mabyn Read proposed a vote of thanks to Dr. McCrindle for his address; this was seconded by Dr. J. Orton, supported by Dr. Barwise and carried unanimously.

Southern Branch.—A meeting of the Branch was held at Gloucester Lodge, Worthing, on Friday, 4th October, 1912, at 2.30 p.m.

Present:—Drs. Cameron, Gibson, Willoughby, Stott, Walker, Forbes, Wilshaw, Hanley, Griffiths,

* Published in this issue.

THE NEED OF BREADTH OF VIEW IN PUBLIC HEALTH PROBLEMS.*

By S. G. MOSTYN, M.A., M.B.,
Medical Officer of Health of Darlington.

SINCE public health has come to occupy a recognized position in the administrative scheme of this country, there has been a steady increase in the duties imposed by the legislature on the medical officers of local authorities. Year after year new Acts come into force, the field of our work is enlarged, and a corresponding demand arises for wider knowledge and more complete understanding of the growing complexities of our civilization. During recent years this increase in complexity has taken place more rapidly, so that now it often happens that before we appreciate the full meaning of some important question that we have in hand and determine its relationship to our own special conditions, we find a new undertaking demanding our consideration. While in the time of our grandfathers a man of no extraordinary ability could get a comprehensive view of the whole domain of knowledge, it is now becoming more and more difficult to see in true proportion to its surroundings a single one of the many departments into which knowledge has been divided. Our predecessors could not only know their own subjects thoroughly, they usually had also more than an elementary acquaintance with allied studies. Without knowledge of their context few things can be known completely, and our context is growing larger every day. A wide outlook is of the greatest help to progress, with it we are able to see in which direction advances are likely to be made, and by intelligent discussion with men of varied experience we learn to understand and benefit by the habits of thought, and to estimate the rigidity of the logical processes used in other branches of learning. This interchange of ideas is now becoming increasingly difficult, and there seems a danger that soon only crude results will be accessible to those who have not made a special study of a subject. So rapidly has our knowledge of natural science grown that one man can now know thoroughly only a division of a subject. Since our school-days chemistry has become three sciences, each with its own modes of experiment and expression, and a chemist is rarely proficient in more than one of these branches. While the problem has become harder our ability has not kept pace with it.

* Presidential Address read before the Northern Branch at the Meeting of October 25th, 1912.

Most of us when we try to think are well aware of the limitations within which our powers work, we realize the meagreness of our output at its best, and often chafe under the criticism of those who from want of experience have not learned the existence of physiological and psychological restraints to mental work. If from this limitation to mental power we are unable to learn the context of what we know, a tendency arises to become narrow and unsympathetic and to under-estimate the importance of subjects and methods which we only partially understand. A danger exists here: we may thus become isolated, and few persons continue to do useful work in isolation; we look to our companions for momentum to carry us over the dead centres of life at times when we lose heart and progress seems hopeless.

The rapid increase in our public health work and the growing difficulty of keeping pace with its developments, of themselves, tend to diminish the soundness of our conclusions; our life is more condensed, and those whose work is administrative are now forced to learn conditions, consider them, decide, and act with less delay than in any previous period. A letter, for instance, comes by the first post, by means of the telephone several people are interviewed, a dozen questions are asked and answered, and in ten minutes a matter is settled that would have taken half-a-day a generation ago. This is true in occupations of all kinds; shorthand clerks and typewriters encourage rapid expression; our output is increased, but the quality of the work is in danger. Thirty years ago inevitable delays gave time for thought and mental recuperation; the more rapid methods of to-day impose increased strain, if we would avoid unwise decisions, and as public officials we cannot afford to make mistakes. The increasing intensity of our work leaves us less able to appreciate and keep in touch with the rapid changes around us.

At the recent meeting of the Royal Sanitary Institute the Archbishop of York stated:—"There may be need in the future for amendment of some of our Acts of Parliament, but, speaking roughly, the stage of legislation is passed; the stage of determined and persistent administration is still with us." If the Archbishop is right and our principal work is now to carry into effect powers already obtained, we have greater need than ever to see that our decisions are well considered, in view of the more organized opposition of those whose

interests are affected, and of the closer scrutiny, both by friends and opponents, to which our actions are exposed.

If I have made clear my view that we have arrived at a state in which a higher standard is required, and that we must convince the public that we understand the full significance of the work we take in hand, and obtain their confidence in our wisdom as well as in our honesty, it will be necessary to consider how this can be done in view of the increasing demands on our time and the greater difficulty of our problems. An important part of the solution of the difficulty must be looked for from co-operation; problems must be investigated and experiments must be tried, when necessary, by communities and individuals who have special opportunities for a particular work. We are already indebted to many of the large towns, and to the able officials whom they have appointed and supported, for the valuable and often expensive attempts they have made to solve problems of importance to public health; attempts whose value must not be estimated solely by the extent to which they have been successful, as much valuable information may be obtained in spite of, or even on account of, failure, and the necessity for an experiment must be decided by consideration of the circumstances before the experiment was begun. To obtain the full value of the time, thought, and money thus expended, it is necessary that the results of such trials should be made as readily available as possible to a busy medical officer of health. Of course we have our technical papers, but there is no certainty that the results we want may be published in them, and is it not the case that these papers are too large and that the burden they add to our duties is already too heavy? We dare not neglect them, but we cannot possibly remember all that we read, and with increasing completeness in our records we have greater need of some clue to direct us rapidly to what we are in search of. Recently notable assistance of this kind has been given us by the Registrar-General and the Local Government Board. Before last year the classification of deaths for annual reports entailed considerable work and with the best intentions it was difficult to be consistent in applying principles of selection when several causes of death were given. In a matter of this kind consistency is one of the greater virtues, and I have often felt that the time and thought given up to this work were worth more than the result obtained;

especially as I knew that, after all, my lists, even if consistent throughout, would probably differ from those that any one else would have made. In the last twelve months the Registrar-General, by issuing his *Manual of Causes of Death*, has done away with this difficulty for us in a most satisfactory manner; and in this instance the work has been done, as it should be, by the man or office that has the widest experience. Other important questions, especially with regard to foodstuffs, have recently been studied by officers of the Local Government Board, and I would also mention the interesting reports on flies lately published. I hope the time is not far distant when vexed questions connected with the composition of milk and the destruction of carcasses for tuberculosis will be made the subject of exhaustive investigation, and our powers and duties arising therefrom will be clearly defined by the legislature.

If, again, it were possible to find out rapidly by reference to a central bureau, what was the practice in various parts of the country with regard to any question that arose, much time would be saved and we should all benefit. The work of sending a circular letter to various districts and tabulating the replies received is tedious, and the same questions are asked and answered over and over again; it would be much better if such information could be collected and made available, either under the direction of a special officer or department of the Local Government Board, by our own or a similar society, or by one of our professional journals. May I suggest that such work could well be superintended by some of our colleagues, who after experience dating from the heroic days of public health have now earned well-deserved rest from public duties. While I should like to see further help from the Local Government Board, I should indeed be sorry to see interference by a central board with the details of our work, such as seems to exist in some other branches of the public service. Under the present system there is scope for individuality, and the character of the work done in different districts differs in accordance with the personality of the various councils and their officers. The evil effects of over-systematization readily show themselves; systems are good only when they are as comprehensive as the objects to which they are applied, and such a subject as public health which has as a whole, so far, exceeded the grasp of even the ablest of our administrators, will require for a long time thoughtful, tentative

treatment and methods; and results and methods, desirable in themselves, will require constant modification before they can be applied to a particular place at a particular time. We do not yet know the best way, or even if there is a best way, to do our work, and I hope that no attempt will be made to enforce a uniform system until we have had far more experience.

It is in conditions such as now exist that frequent exchange of opinions, and knowledge of what is occurring in different parts of the country are of special value; and I have derived the greatest help from hints received at the meetings of our Society, and from the congresses that I have attended from time to time. Nevertheless, the advantages that we can obtain from free intercourse with our colleagues are not greater than those we can obtain from workers in other branches of knowledge. It is important, if we are to keep an honourable and respected position among the learned professions that our acquaintance with other sciences and arts should be thorough; but when our knowledge is not deep, we must be ready to recognize the limitations imposed by our ignorance. We have to deal with problems of engineering, geology, chemistry, physics, law, and education, in addition to those of medicine; and in the application of our work we need the insight of the psychologist and the skill of the diplomatist daily. It is necessary for us to deal with these classes of problems in such a way that experts will respect us, if our profession is to take a high position.

It is important, too, that we should be able to estimate the justice of the criticisms to which we are subjected, neither timidly acquiescing in nor scornfully disparaging what we do not understand. While we are ready to learn from all who have made a special study of matters with which we have to deal, and welcome new methods of investigation and discussion, we may ask that our critics have a grasp of the subject matter which they criticize. I am not here referring merely to the ordinary busy-bodies whose ignorance and impertinence cause so much trouble to public officials, who have not sufficient ability to understand the crudity of the schemes they advocate, and, measuring our corn by their own bushel, give us no credit for the care and arduous work which a career such as ours entails. Our work has lately been open to the attack of a professor of eugenics, a distinguished mathematician, who chose a most inopportune time to publish

his opinions. I need not tell anyone here that I am in no way wanting in respect for mathematics. I deplore the fact that mathematical methods, modes of expression, and logic are understood by so few of us, and I am afraid that Professor Pearson's lecture will retard the introduction among us of the methods he uses. I will do my best to explain what I consider to be the situation in this matter; the field of the mathematician differs from that in which our work is done in an important manner. Mathematics is a science which concerns itself with relationships between quantities rather than with the quantities themselves; the subject matter of its problems is small, but the reasoning applied to this matter is intricate and great in amount. The opposite is the case with our work, in which the field covered is large and, as I have already said, constantly and rapidly growing in extent; the relationships between the quantities with which we have to deal are complex, often unknown, and rarely, if ever, completely understood. The inter-dependence of these quantities can rarely be determined *a priori*, and, as with most of the great problems of the world, we are driven to inductive methods, empirical connexions, and approximate solutions. It might be more pleasing to logical beings if it were otherwise, but with us it is a question of action not theorizing, and we cannot ask the world to stand still while we study its structure; the development of our civilization is at stake. I cannot help thinking that Professor Pearson has suffered from the defects of his methods, and, charmed with the beauty of his logical machine, has paid too little attention to the material he has submitted to its operation. Let me recall an instance where the results obtained by a still more eminent mathematician led to similar misunderstanding and hasty judgment. Some years ago Lord Kelvin, by applying mathematical methods to observed temperatures of the earth's crust, arrived at the conclusion that a certain number of millions of years was a superior limit to the time that had elapsed since the earth began to solidify. Lord Kelvin was too good a natural philosopher not to realize that his results only held good on the assumption that his preliminary analysis was accurate and complete, but some less cautious quoted him without qualification, imputing to his result an accuracy which no doubt existed in his logic, but which the subsequent discovery of radium has shown did not hold good in his

preliminary assumptions. We see now that the subject was larger than Lord Kelvin's analysis and his result was untrustworthy. Geologists who could not make their scheme fit in with the few millions of years allowed them were no doubt relieved when they learned that their theories were no longer under the fire of the mathematicians' heavy artillery. This is, I think, a good example of the mathematician's weakness, his tendency to consider accuracy of method rather than trustworthiness of data or completeness of analysis. There is, or should be, in any conclusion always the qualification that the result holds good if the data are correct and the analysis of the problem is accurate. Professor Pearson, no doubt, knows this—it is in daily use as part of the mental equipment of the mathematical philosopher who applies his methods to problems of engineering or physics, though he may indeed omit to state it explicitly when conversing with some one of similar training and experience—and I feel that Professor Pearson was wrong and guilty of culpable negligence, when before an audience composed most largely of those who knew the assumptions implied by his method, nor of sanitary experts, who could estimate the worth or worthlessness of his results from their own experience, he made statements so easy to repeat as unconditioned, and which could be so readily quoted in support of those whose personal interests are opposed to our work of ridding this land of ours of the weeds that choke its progress. I have not analysed Professor Pearson's lecture or discussed it in detail; it is not for me to show how he comes to be wrong. There is no injustice in this, I am merely applying the method of *a posteriori* criticism, which I take to be the accepted method of the eugenic statistician.

We are under no logical compulsion to accept Professor Pearson's results nor are we concerned as to whether the fault lies with his method or with his data; our legitimate complaint is that his results are likely to be quoted as facts without the necessary qualifications. It is possible that Professor Pearson's argument may really have shown that some of our colleagues are imperfect as logicians or collectors of statistics; even this is quite different from proving that the courses of action that they advocate are wrong or unnecessary. Many times in the history of the world have right conclusions been arrived at empirically and supported by faulty logic. It must be remembered that our profession is an art first,

and, as such, is still in advance of the "pure science" of hygiene. For many years to come the appeal in public health will be from theory to observation and experience. If the title of Professor Pearson's address had been "A criticism of the logic of some medical officers," it would have excited little interest, and any one who wanted to might have answered it in detail; we might have found out what was valuable in it and profited by it accordingly; as it is, it reads like an attempt to disparage other efforts to do good in order to praise the new science of Eugenics, a science of which the methods cannot yet be considered as established. Methods, like men, have "personal equations" which may be determined from the results they yield; and we are justified in condemning methods which the experience of men whose ability and honesty we have good reasons to respect is so consistent in opposing.

An attack such as this is likely to discredit the application of mathematical methods to our work and to retard their more general adoption. Mathematics, as a philosophical method, has indeed much to teach, not only public health but many of the natural sciences. The science of mathematics is not cunningly contrived, but has grown as the essence or soul of natural philosophy, its complexities are those of Nature herself. It gives us the best method we have of dealing with a problem so as to avoid introducing old prejudices or new ideas unconsciously, but on the other hand it will give us nothing that is not contained in our assumptions. The stating of the problem for solution and the discovery of the terms in which it must be expressed are often the most difficult part of the work; and the solution obtained is the solution of the problem as stated, which often differs from the question for which we wish to find an answer. This is particularly the case when the question is complex and the varying elements are many and elusive. A brain that is clear and free from prejudice, an outlook that is wide, ready to learn, and sympathetic must certainly be expected when at last a Newton comes to show us the first principles of the dynamics of life and health.

I shall have failed in my object if I have not left the impression that I consider the future of our profession to be bound up with and dependent upon our absorbing from our contemporaries in all branches what is good in their knowledge or their methods. The mutual distrust and want of sympathy that exists between workers in various sciences, and the

contempt that is earned by the clumsy use of other men's tools, have done much to damage the progress of natural science in England. We see an instance of this in the aversion of so many, who have been trained in the more accurate sciences, to other sciences in which the conclusions are not reached so syllogistically. The physicist, for example, after reading a book on physiology refuses to accept the difficulty of the subject as an excuse for poor reasoning, and is inclined to thank God that he is not as other men are. Greater trust in one another, the habit of always estimating the value of our results, and straightforwardness in distinguishing between what is good absolutely, and what is only the best we can do, would do much to strengthen our position. We are concerned, too, in the highest degree in raising the general intelligence of the public and taking them into our confidence. There is a tendency to overstate an argument when we are opposed by fools, and such overstating is not good for us. We must advance as one body; and narrowness of outlook is fatal. The quotation from Rabelais, that Mr. Seeböhm's own tree used at the York Congress, well deserves consideration: "Beware of the man who peers out of a hole; he is a rabbit."

It would not be fitting for me to conclude his address without referring to the approaching withdrawal from official duties of Dr. Armstrong, whose hospitality our branch has enjoyed for so many years, and for which I desire to thank him on behalf of all of us. I do not speak for myself alone when I express a deep sense of appreciation of the kindly friendship and the sympathetic advice we have always looked for and obtained from him; the results of his long experience were always at our service, and were mostly highly valued by those who by intimate personal relationship knew how thorough he was in every detail of his work. His intense conscientiousness and painstaking accuracy are to be seen on every page of the reports which he drew up on many important subjects. The breadth of his view and sympathies remain as evidence of the wider culture of the more leisured past. Though his official connexion with the post he has held so long may be severed we shall still regard him as the most honoured member of our branch, and we hope that his more ample leisure will allow him more than ever before to give us the benefit of his guidance.

The late Dr. John Manson Knight, medical officer of health for Scarborough, left personal estate valued at £2,707.

UNDERGROUND SLEEPING ROOMS.

By CHARLES PORTER, M.D., B.Sc.,
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TO a vagueness and incompleteness of details as to procedure in sub-section 7, Section 17 of the Housing, Town Planning, etc., Act, 1909 (which relates to underground rooms habitually used for sleeping purposes), in all probability is due some of the hesitation on the part of local authorities to take proceedings, or even draft the regulations referred to in the sub-section.

This being so, there seems to be some justification for the publication of some notes of a case in which the proceedings were carried through to the police court, more especially as it serves to bring out some points of general interest in connection with the administration of the Act of 1909 as a whole.

The authority instituting proceedings was the Council of the Metropolitan Borough of St. Marylebone, and the case referred to a series of five underground rooms occupied by the servants in a large house in the West End of London, the tenant of which conducted it on the lines of an hotel, letting off suites of furnished rooms with attendance.

The fact of the occupation of the rooms was discovered prior to the coming into force of sub-section 7 of Section 17 of the Act, but proceedings could not be instituted, and the tenant was advised that when it did come into operation action would be taken if the rooms still remained occupied.

Soon after the sub-section came into operation a representation relating to each of the rooms was made to the Public Health Committee of the Council—to which are delegated all powers under the housing portion of the Act—but it was determined to refrain from making closing orders until regulations with regard to underground rooms, then in course of preparation, had been approved by the Local Government Board.

These regulations, which are based upon the requirements relating to underground rooms in Section 96 of the Public Health (London) Act, 1891, and practically contain the same provisions, were approved early in February, 1911.

Almost immediately afterwards, acting upon the instructions of the Public Health Committee, a house-to-house survey of underground rooms in houses in some of the better streets was made. The proportion of rooms found to be occupied contrary to the Act and the

regulations was, considering the outcry which is continually made by a certain section of the population, and the suspicions which are harboured by this class as to the unjust, even inhuman, treatment meted out to their servants by the wealthier classes, remarkably small.

Amongst those who did house one or more servants in basement rooms there were a few who (only unwillingly)—chiefly on the grounds of morality, when servants of both sexes were employed or on those of safety from fire and burglary—agreed to discontinue the practice.

Nor were the objections limited to the employers. The servants themselves in practically every instance expressed themselves as preferring to remain in occupation of the basement rooms, and left absolutely no reason to doubt that, if compelled to change their quarters, they would seek employment elsewhere.

Though it is to be noted that no person took exception to action on the part of the local authority on legal grounds, no question indeed of legality was raised, it was determined to take all steps—closing order, application to a magistrate and so on—in one case and to make of it more or less a test case. The case chosen was that referred to in these notes.

The representations of the medical officer of health were again laid before the committee, and, the circumstances having been considered, closing orders were made.

The circumstances referred to were, briefly, that there were five rooms occupied habitually for sleeping purposes—some by one, others by two persons, and all failing markedly to comply with the regulations. In some of the rooms there were distinct evidences of dampness; in none was there sufficient natural light. The effect produced by the closing orders was practically nil. The owner took no steps either to comply with them or to oppose them. Numberless complaints were made by this person of injustice and of hardships to all the parties concerned—the servants and so on. Hints to appeal to the Local Government Board were not accepted, nor was a suggestion that the case was one in which legal advice should be obtained.

At the end of several months it was decided by the Committee that application should be made to a Court of Summary Jurisdiction for an order in accordance with the provisions of the sub-section. Before this was done, however, it was considered advisable to take the opinion of counsel on the whole matter.

Among the points submitted to counsel were some which are of interest generally in connection with the administration of the Act of 1909. For instance, though several inspections were made of the rooms in question never once was the formal notice referred to in Section 36 of the Act sent. Many administrators and others regard this as essential; but, according to counsel, the fact that no notice was served did not invalidate the representations, and formed no bar to proceedings. The fact that the officers who entered were not "authorised in writing," either generally or specifically under the Act, was also regarded as being without influence in the proceedings.

A question relating to the period which had elapsed between the service of the order and the taking of proceedings is also of interest. As a fact, for one reason or another, the time between the service of the order and the commencement of court proceedings was something over six months, and it was feared that this might oust the magistrate's jurisdiction, and that it might be necessary to commence *de novo*. Counsel's opinion was that, as there was disobedience to the order, inasmuch as the rooms continued to be occupied, the offence was a continuing one.

One great difficulty experienced in the case was as to the status of the person who let-off the floors, engaged the servants, and provided them with sleeping accommodation in the basement. In Section 17 three classes of persons are referred to, viz., owners, occupiers, and "occupying tenants," although, it may be noted, as pointed out by counsel, these last are not defined. The term "owner" is, of course, defined; and before the orders were made it was ascertained that the proprietor of the establishment had an owner's interest, and was, therefore, the person upon whom the orders must be served.

Because by Sub-section 3 of Section 17 it is necessary to serve copies of closing orders on "occupying tenants," and by Sub-section 7 to take proceedings against "occupiers," it was essential that some information should be obtained with regard to these. Counsel was, therefore, asked to state whether the proprietor, in addition to being the "owner" was, though he did not actually reside on the premises, also the "occupying tenant," and what was the position of the servants; were they in fact "occupying tenants" or "occupiers," and should they receive notice of the closing order, and be summoned individually for refusing to quit?

The greatest difficulty was admittedly experienced by counsel in answering these questions, and in the end he played for safety. The "owner," he considered, must be regarded as "occupying tenant," and must be summoned. The servants, being "members of the family circle," were not "occupiers"; nevertheless, he thought, they should be served with notice, and also summoned.

On the question as to the punishment of persons found guilty of disobeying closing orders and magisterial orders, little or no information could be obtained. The opinion seemed to be that no power to punish was given in the Act of 1909, and the penalty clauses in the other Housing Acts had all been repealed. Reference was made to the Summary Jurisdiction Act, 1879; but, even if this were applicable, it was pointed out, the person liable to punishment would be the "occupying tenant" (against whom the magistrate's order was made), whereas the person really deserving of punishment, in the majority of cases, would be the person upon whom the closing order was served.

Doubtless, as the Scottish Local Government Board state in their last Annual Report, any magistrate who is given power to make an order has of necessity power to enforce that order; but here again it is the tenant and not the owner who suffers.

Despite the fact that the outlook did not seem particularly clear, and that the section, the more closely it was studied, appeared to present more and more pitfalls, it was decided to serve notices of closing orders all round—on the person representing owner and occupying tenant and on the servants as occupiers—and to follow up, if necessary, with summonses.

There followed an immediate stampede on the part of the servants, a performance which was repeated on several occasions both with notices and summonses. This must have been exceedingly inconvenient for the owner, but eventually matters were satisfactorily arranged, and the owner appeared in court to answer summonses against himself and his servants.

No difficulty whatever was experienced at the hearing, and practically without hesitation the magistrate made the necessary orders.

The law, it may be mentioned, was not made the subject of argument as the owner was unrepresented and called no witness, except a surveyor, who stated that if there were an adjournment he might be able to suggest

alterations which would lead to improvement. This request was not granted.

That there should have been no analysis of the law before the magistrate was unfortunate as the decision in this case cannot be regarded as conclusive. Some of the points referred to in the case which was submitted to counsel require further to be cleared up. Even where there are regulations there can never be any certainty about the steps taken or to be taken, and in many districts there must be considerable necessity for powers of dealing with underground sleeping rooms. In its passage through Parliament Sub-section 7 came in for a great deal of criticism, and was cast and re-cast many times. It seems improbable, therefore, that any Government will voluntarily decide to interfere with it. A test case with a decision against a local authority, if the sub-section is so defective as many seem to think, is absolutely essential.

The case described above, because it is so inconclusive, is of little use, but if, because the magistrate did make an order, it induces some other body to take action it will not be without value.

APPOINTMENTS.

DR. J. ARTHUR has been appointed medical officer of health to the Wellingborough U. D. C.

DR. C. S. BRENNER has been appointed medical officer of health for Chiswick.

DR. A. S. DAVID, of Fyfield, has been appointed medical officer of health to the Ongar R. D. C.

DR. WILLIAM ARNOTT DICKSON, of Kirkcaldy, assistant medical officer of health for Fife, has been appointed assistant tuberculosis officer for Fifeshire.

DR. JOHN GUY has been appointed tuberculosis officer for the city of Gloucester.

DR. EDWARD KEGAN has been appointed by the Donegal County Council tuberculosis officer for the county.

DR. DAVID CONNOR KIRKHOPE has been appointed medical officer of health and school medical officer to the Tottenham U. D. C.

DR. J. D. LEIGH has been appointed medical officer of health for Hartlepool.

DR. R. MALCOLM has been appointed medical officer of health for Thurnscoe.

DR. J. MAGILL has been appointed tuberculosis officer by the Health Committee of the Stoke-on-Trent Corporation.

DR. H. P. NEWSHOLME has been appointed assistant medical officer of health and school medical officer of health to the borough of Southend-on-Sea.

DR. A. F. BERNARD SHAW, has been appointed assistant medical officer of health and assistant school medical officer, to the City and Port of Cardiff.

DR. A. W. TUXFORD has been appointed school medical officer for the Holland division of Lincolnshire.

DR. H. DE CARLE WOODCOCK has been appointed chief dispensary medical officer by the Leeds Corporation Sanitary Committee.

PRUSSIAN MILK REGULATIONS.*

NOTE.—These Regulations, primarily made to control the sale of cows' milk, are intended to apply to the sale of milk of other animals except where the special conditions of production, preparation, and sale of such milk make the application of the Regulations impracticable.

PART I.—MILK FOR GENERAL USE.

Art. I. *Definition*.—For the purposes of these Regulations, "milk" means fresh (whole or skimmed), cooked or otherwise prepared cows' milk, sour or butter-milk, and cream.

Art. II. *Supervision*.—Every person before commencing to sell milk shall give notice of his intention to do so to the local sanitary police. Such notice shall state the address of each place at which the sale of milk is to be carried on, and shall be given whether the milk is obtained from the vendor's own cows or through a wholesale or retail dealer, and also when it is intended to sell milk from a shop or on a round at the customers' own premises. Notice shall also be given of every change of address and of every new branch premises opened for the sale of milk.

Such notice shall not be required where the sale of milk is occasional or only temporary.

Art. III. *Composition and Quality of the Milk*.—It shall be unlawful to sell or expose for sale any milk herein described, that is to say:—

(a) Dirty milk, whereof the standard or test shall be as follows:—

Apparatus.—A cylindrical jar or bottle made of colourless glass, on the side of which shall be engraved a mark denoting a capacity of half or one whole litre. The bottom of the jar or bottle shall be flat, and its diameter one-half the height of the mark above the bottom of the jar or bottle.

Test.—The jar or bottle is to be filled up to the mark on the side thereof with milk, and to be left standing for half-an-hour. If at the end of that time there be a distinctly visible deposit the milk shall be deemed to be dirty.

(b) Adulterated milk—that is to say, milk to which has been added water, ice, or preservative; but the addition of "milk-ice" to fresh milk, or of rennet or souring bacteria to sour milk shall not be deemed to be acts of adulteration.

(c) Milk which smells tainted or putrid, or is unnaturally coloured, or contains blood, or is slimy or bitter to the taste.

(d) Milk taken from cows immediately before or after calving, or so long as the milk curdles on boiling, or is in any way different in appearance, smell, or taste from ordinary wholesome milk.

(e) Milk taken from cows which are in a state of ill-health, unless the veterinary officer certifies that the milk from such cows is fit for sale.

[This Regulation shall apply to the milk of cows suffering from any disease accompanied with increased temperature or fever, inflammatory diseases and eruptions of the udders and teats, continued diarrhoea and acute disturbances of the digestive organs and pathological discharges for the uterus or vagina.

The milk of cows suffering, or suspected to be suffering, from foot and mouth disease or tuberculosis, within the meaning of Sec. 10.1, No. 12, of the Law Relating to Cattle Diseases; of June 26th, 1909, can only be sold subject to the provisions of Secs. 154 and especially of 162 (1) under e, and Secs. 305 and 311 of the Regulations made by the Sanitary Police in pursuance of the Order of the Minister for Agriculture, Domains, and Forests dated May 1st, 1812.]

(f) Milk taken from cows to which potent medicines, likely to be excreted by the milk, or from cows to which any such medicine has been given within three days preceding their milking. The following are to be deemed medicines to which this Regulation applies:—Aloes, arsenic, tartar emetic, arekolin, hellebore, preparations of mercury, potash, eserine, pilocarpine, strychnine, or other alkaloids.

(g) Milk taken from cows fed on mouldy, foul, rancid, or otherwise unwholesome or decomposed foods or on castor-oil cake or mustard husk.

Art. IV.—*Descriptions of Commercial Milk*.—

(1) The designation "fresh milk" shall be used only to describe milk which does not curdle on boiling or when mixed with an equal bulk of spirit containing 70 per cent. of alcohol. Fresh milk may be of two qualities, *viz.*, "full" or "whole milk" and "skim (*mager*) milk."

* A free translation from the transcript published in *Veröffentlichungen des Kaiserlichen Gesundheitsamts* of September.

(2) The designation "full milk," used without further words indicating the proportions of the constituents of milk, shall be applied only to milk which consists of the mixed milks (including the foremilk and strippings) of one or more cows, to which nothing shall have been added except "full milk ice," and which contains at least 2·7 per cent. of fat, and from which none of the milk constituents have been abstracted.

Provided that a full milk in which the proportion of 2·7 per cent. of butter-fat cannot be guaranteed may be sold under the designation of "full milk of second quality," or "full milk containing less than 2·7 per cent. of butter-fat."

(3) Any milk from which any of the fat content has been abstracted shall be sold or offered for sale under the designation of "Skim milk" only. A declaration may be made at the time of sale as to the guaranteed proportion of butter-fat which such milk may contain. The local police may direct that such milk shall be sold in specially shaped or coloured vessels only.

(4) Any milk which has been heated to 70° C or over shall not be sold or offered for sale unless declaration be made of the heating by means of a suitable label, and when sold in bottles the milk must be sold on the day on which it was so heated.

(5) No milk shall be designated "pasteurised" unless it has been treated in a pasteurising apparatus, of approved pattern, within fourteen hours of being drawn from the cow, and no milk shall be designated as "sterilised" unless it has been treated within the like period in an approved sterilising apparatus. Sterilised milk shall be sold in sealed bottles only, and the seal of every such bottle shall be unbroken at the time of sale.

(6) Any heated, pasteurised or sterilised milk shall be further described as full or skim milk as the case may be, and if there be any mixture of any aforesaid milks with fresh milk, such mixture shall be declared.

Art. V.—*Dairy Processes*.—(1) No person having purulent or discharging eruptions, ulcers or wounds on the uncovered part of his body shall handle or otherwise deal with milk intended for human consumption.

Provided that the foregoing regulation shall not be deemed to amend or repeal any regulation made under any Act of Parliament or Order with reference to infectious diseases.

(2) With a view to protecting the milk from contamination by dirt, the following precautions shall be observed:—

The hands and forearms of the milker shall be thoroughly cleansed with clean water and soap. Such cleansing shall be repeated if the hands or forearms become contaminated with any filth during the milking. The udder of the cow shall be cleansed by wiping with a clean dry cloth, or, if the udder be coated with filth, by washing with clean water.

(3) The milk obtained by the first compression of the teats shall be rejected.

As soon as the operation of milking has been completed, the milk shall be freed from dirt by straining, filtering centrifugalisation or some other equally effective method and cooled.

(4) Old bedding or straw which has been used for packing goods shall not be used as litter for the cows.

No removal or renewal of litter shall be effected during the process of milking, nor shall cows be fed during that time.

(5) Local regulations may be made by the sanitary police for dealing with the following matters:—The material to be used and the method of construction of the floors of cowsheds, and feeding troughs or mangers; the removal of manure; the cleansing and ventilation of cowsheds; the cleansing and grooming of cows; the cleanliness of persons engaged in or about cowsheds; the cooling and storage of milk; and any other matter or precaution requisite for the protection of the milk from contamination of all kinds.

In the framing of any such regulations due regard shall be had to the special conditions of the locality affecting the business of a cow-keeper or milk vendor.

Art. VI.—*Transport*.—(1) The provisions of section (1) of Article V. shall apply to all persons taking any part in the transport of milk or in the cleansing of milk vessels or milk stores.

(2) No receptacle made of a material which is likely to contaminate milk shall be used for the conveyance or storage thereof. This prohibition shall extend and apply to vessels and receptacles made of copper, brass, zinc, pottery or earthenware which is defectively glazed, iron imperfectly or defectively enamelled, or rusted, fir or other soft woods.

Vessels from which milk is sold, being vessels other than glass bottles, shall be provided

with overlapping close-fitting covers, and such vessels shall be kept covered except as may be necessary for filling or emptying the same.

All vessels shall be kept at all times in a state of cleanliness. For the cleansing of such vessels clean water shall be used, to which may be added washing soda or lime, but if either thereof be used, all vessels shall be subsequently thoroughly rinsed out with clean water. All vessels not in use shall be stored after cleansing on a shelf in a clean place, with the openings of the vessels downwards.

(3) No rags, paper, straw or similar material and no broken or torn rubber rings which contain lead, shall be used to make the opening of any milk vessel air or water tight. Specially manufactured paper stoppers or plugs may be used for closing milk bottles, but such stoppers or plugs shall be destroyed after they have been once used.

(4) Milk receptacles with a capacity of one or more litres shall be constructed with an opening of sufficient size to admit the hand for the purpose of cleansing, and vessels of a capacity of less than one litre shall be constructed of such form as will allow them to be readily and thoroughly cleaned by means of a suitable brush.

All measures used in connection with the sale of milk shall be provided with suitable handles to prevent the milk coming into contact with the hand of the person measuring the milk.

(5) All taps fitted to milk receptacles shall be kept thoroughly clean and wholesome, and if made of metal, neither the metal nor any tinning of such metal shall contain lead or zinc in a proportion exceeding one per cent.

(6) A cart or other conveyance used for the transport of milk shall not be used for conveying rags or kitchen refuse, unless such rags or kitchen refuse be packed in suitable receptacles having closely fitting covers.

No water shall be carried on a cart or other conveyance when in use for the transport of milk.

The driver or any other person travelling in a cart or other conveyance carrying milk shall not sit on the milk vessels.

A cart or other conveyance used for the transport of milk shall not be used for the conveyance of any sick person.

All milk vessels shall be protected from the sun during transport.

(7) All vessels used in the sale of milk to customers must bear on the sides thereof a

legible and ineffaceable inscription describing the class of milk sold from such receptacles.

Where milk is sold in glass bottles, such description may be given by means of labels either pasted on or tied to the bottles.

When milk is sold from a closed tank-cart the description of milk sold from such cart shall be legibly painted on the side or end thereof immediately above the tap of the tank.

The foregoing provisions may be applied, at the discretion of the local sanitary police, to vessels, receptacles, and tank-carts used in the delivery of milk to the retailer or milk purveyor. Vessels, receptacles, and carts used in the delivery of milk by milk producers to milk-collecting stations may be exempted from the said provisions, and shall be so exempted when skimmed or separated milk is handed back by the station to the person bringing the milk.

Vessels and receptacles used in the sale of milk on any milk-vendor's premises shall be so placed that the customer can read the inscriptions on such vessels or receptacles which describes the quality of the milk sold.

Subject to the requirements of the provisions relating to the control of the sale of milk, all vessels used in the transport of milk to a milk vendor by means of an intermediate collector or agency shall have their covers closed and sealed with lead seals, which shall remain unbroken until delivered to the milk vendor.

(8) All milk before being transferred from one receptacle to another shall be thoroughly mixed.

(9) No vessels intended for the storage of milk shall be used for any purpose other than the storage of milk.

(10) Every room used for the storage of milk shall be kept cool and in a cleanly condition, and shall be free from dust. Every such room shall be thoroughly ventilated, shall not be used as a dwelling, sleeping, or sick-room, and shall not communicate directly with such rooms.

The flooring of every room used for the storage of milk shall be constructed of jointless material which can be readily cleansed.

No animals shall be kept in a room used as a milk store, nor shall any goods or commodities likely to communicate a smell to the milk, other than dairy produce, be stored therein.

(11) Any officer of the sanitary police, or any person authorised by that force, shall at all times have access to any premises or to any

part of any premises where milk is sold or offered for sale.

PART II.—SPECIAL MILK.

Art. I. *Definition*.—"Special milk" is fresh milk containing not less than 3 per cent. of butter-fat in the production or preparation of which all the provisions set out in the first part of this Order as extended or modified by the provisions of this part of the Order have been complied with. Such milk may be described as milk for infants or children or invalids, *kurmilch*, control-milk, or other approved designation.

Any milk which is not described as "special milk," but is sold in circumstances indicating that such milk is being sold as "special milk," shall be subject to the provisions of this part of the Order.

Art. II. *Notice to the Police*.—Any person intending to begin the sale of "special milk" must give notice of such intention to the sanitary police in the form prescribed by Article II. of the first part of this Order.

Art. III. *Dairy Processes*.—(1) Cowsheds used for housing animals selected for supplying special milk shall be used exclusively for housing such cows.

Each cowshed shall be thoroughly well lighted and ventilated, the floor thereof shall be constructed of impervious material with a surface which can be readily cleansed, and the cowstalls be so arranged as facilitate the removal of dung and to permit of all the cows lying down at the same time.

The walls of the shed shall, to at least one and half metres in height, be covered with a coating of impervious material.

The whole of every cowshed and of the stalls therein shall be thoroughly cleansed after each feeding of the cows, and shall be kept, as far as practicable, free from dust and dirt, and in good structural repair.

Suitable washing accommodation shall be provided for the milkers either in the cowshed or in immediate contiguity therewith.

A part of the cowshed may be specially set apart for the milking of the cows, or such milking may be carried on in a separate building.

(2) No cows are to be used in the production of special milk unless such cows have been examined by the official veterinary surgeon and certified fit for such purpose. Such examination shall be repeated once in every three months.

The veterinary surgeon may, if he thinks it necessary, require the tuberculin test to be used at any inspection.

Every cow shall be thoroughly groomed each day.

Any cow taken ill after being certified shall be removed from the cowshed, and shall not be re-admitted thereto until such time as the veterinary surgeon shall have certified that such animal is fit to be so re-admitted.

(3) Cows set apart for the production of special milk shall have only such food-stuffs as are sanctioned by the police regulations.

[The following are among the food-stuffs allowed:—Well-saved hay in a sound condition, free from poisonous weeds, mould, mildew and dust. Straw of cereals of the like characteristics. Corn, bran, groats, linseed meal, and fresh green foods. Such cows may be turned out to grass when the change is made gradually and the outing is regular.

The following food-stuffs are prohibited:—Dairy refuse, food mixtures liable to give rise to digestive disturbances or diarrhoea or produce any special taint or smell in the milk, such specially as brewers' or distillers' grains, molasses, turnips and turnip tops, fermented foods, fish, meat and blood-meal.]

(4) Every person milking the cows shall wear clean clothes and shall be provided with clean overalls.

(5) All milk taken from the cows shall be forthwith removed from the cowshed strained or filtered by suitable processes and at once cooled. If stored the milk shall be kept in a room the temperature of which shall not exceed 12°C, in open vessels covered with clean linen or paper.

(6) No milk shall be sold as special milk which has been taken from the cow more than fifteen hours previous to such sale. Except when sold in quantities exceeding twenty litres daily to hospitals and such like institutions, all special milk shall be sold in sealed bottles made of colourless, or nearly colourless glass.

Art. IV.—*Registration of Selected Cows*.—(1) A register shall be kept by the producer of special milk containing the prescribed particulars for each cow, as set out in the annexed schedule.

(2) At least twice in each week the amount of milk given during the the preceding twenty-four hours by each cow shall be recorded on a sheet, and such record shall be kept on file for not less than six months.

(3) The official veterinary surgeon shall at all times have free access to all parts of the premises where the cows are kept, to all food and milk stores, and to the register required to be kept by the preceding section. He shall

also be entitled to examine all the cows whenever he deems it necessary.

The district medical officer (*Kreisarzt*) shall have power to examine from time to time all persons employed in or about the cowshed or dairy.

SCHEDULE.

Control-list of cows intended for production of special milk.

Owned by

Standing at

Con-secutive Numbers.	Colour, Mark, Age, and other Special Marks.	Date of First Examination by Official Veterinary Surgeon.	Date put in Stall.	Date brought to Bull. ("Covering.")	Date of Calving.	Date and length of time excluded from Stall, and Reason.	Date of excluding of Cows from List of "Special" Milch Cows.	Re-examinations of Official Veterinary Surgeon or Medical Officer.		
								Date of Inspection.	Result.	Any Instructions or other Remarks.

* The description of the cow is to be so accurate that she can with certainty be recognised. To facilitate this the employment of ear-marks or brands on horns is recommended.

THE REGULATIONS OF COLD STORAGE.

RULES and Regulations have been made by the State Board of Health of Massachusetts, U.S.A., governing the business of cold storage, of which account is given in the Board's bulletin for the month of September, the month in which they came into force.

In the Act, under which the Rules and Regulations are made, cold storage is defined as the storage of articles of food at or below the temperature of forty degrees of Fahrenheit in cold-storage or refrigerating warehouses.

Refrigerating warehouses are defined as establishments artificially cooled in which articles of food are stored for thirty days or more at a temperature of forty degrees Fahrenheit or below, and "articles of food" include fresh meat, fresh meat products, except in process of manufacture, fresh food fish, poultry, eggs and butter.

A license is required for all such places, and before it is granted the premises are inspected and required to be put into proper sanitary condition, power being given to the Board of Health to close them until this has been done. A monthly report is required from the licensee showing the quantities of articles of food placed in cold-storage during the preceding three months, and the quantities of butter

and eggs held on the first day of the month in which the report is filed.

Diseased and tainted or otherwise unwholesome food may not be stored, and members of the Board and their inspectors are to have rights of entry for inspection. All articles of food must be plainly marked with the date on which they are received, and purchasers must be notified of the fact that the food has been kept in cold-storage.

The Rules and Regulations are temporary and liable to modification. They relate to the marking of articles of food, and require notice to be given to the State Board of Health when such articles have been in cold-storage more than twelve months, after which they cannot be removed until they have been inspected. Articles kept at low temperatures for less than thirty days are not to be deemed to be kept in storage and leave is required, with statement of the reasons for the application, if it is desired to exceed the period of storage beyond twelve months. Other regulations apply to the structure of the premises, to their cleanliness, and to the manner in which articles of food shall be classified for the purpose of the quarterly reports.

A large power of control is thus given over cold-storage premises and their use. The requirement that purchasers are to be notified that the articles they are purchasing have been kept in cold-storage is undoubtedly equitable.

A STUDY OF THE EFFECT OF FOOD-STUFFS ON MILK.

AN interesting report has recently been published by the Edinburgh and East Scotland College of Agriculture on this subject, under the title of "On the Effect of Heavy Root Feeding on the Yield and Composition of Milk," the authors being Alex. Lauder, D. Sc. (Lecturer on Agricultural Chemistry) and T. W. Fagan, M.A. (Assist. Lecturer and Demonstrator of Chemistry).

The experiments on which the report is based were made with a view to test the effects of rations containing large proportions of roots, and to determine whether cheaper foods (e.g. turnips) could be advantageously substituted for the more concentrated and more expensive foods usually fed to dairy stock. The experiments, which lasted for over three years and were applied to a herd of some 70 shorthorn cows, were carried out in three stages, viz., in 1909 (20 cows), 1910-11 (22 cows), and 1911-12 (18 cows). The animals were divided into two groups as nearly as possible identical *quâ* age, period of lactation, and quality and yield of milk. After a preliminary trial of some three weeks, when all the foods to be used were given, half the cows had the experimental ration, and the remainder continued on their usual (concentrated) diet. The yield of milk decreased on the experimental diet, but the the proportion of fat was increased.

Experiment.	LOT I. Turnip Ration.		LOT II. Ordinary Concentd. Ration.	
	Total yield of milk, lbs.	Average per cent. of butter fat.	Total yield of milk, lbs.	Average per cent. of butter fat.
I. 1909—9 weeks... (10 cows to each lot)	15,240	3.49	15,818	3.09
II. 1910-11—8 weeks (11 cows to each lot)	13,920	3.55	14,069	3.35
III. 1911-12—10 wks. (9 cows to each lot)	14,345	3.68	15,637	3.26

The approximate differences between the two rations were:—4 lbs. of concentrated foods (meals and grains) with 112 lbs. of turnips to Lot I, and 10 lbs. of concentrated foods and 40 lbs. of turnips to Lot II. Each lot received in addition 15 lbs. of hay and unmeasured amounts of straw. The proportions of albuminoid and dry matters per ration were:—

Experiment.	Albuminoid ratio.		Total Dry Matter.	
	Lot I.	Lot II.	Lot I.	Lot II.
Experiment I.	1: 7.4	1: 7	27.1	26.1
" II.	1: 13.5	1: 7	29	26.7
" III.	1: 14	1: 7.6	28.6	26.7

It will be noticed that, while the weight of concentrated food has remained constant "throughout the experiment, the richness of the food in the turnip ration has been reduced

in successive years." The albuminoid ratio in the concentrated rations was throughout approximately 1:7—the proportion usually recommended for dairy stock—but those in the turnip ration ranged from 1:9.4 to 1:14.

The first effect of the turnip ration was to cause a rapid fall in the yield of milk, and although there was subsequently a slight recovery, the yield remained lower than that of the lot on the concentrated ration. In experiments II. and III. the rations were transferred gradually between the two lots, and the same decrease in the yield was observed.

The following table comparing the amounts of fat fed to the animals and yielded by them is of considerable interest:—

	LOT I.			LOT II.		
	Total fat in ration, lbs.	Total fat in milk, lbs.	Diff. in milk, lbs.	Total fat in ration, lbs.	Total fat in milk, lbs.	Diff. in milk, lbs.
Experiment I.	476	531	55	359	488	129
" II.	311	495	184	363	472	109
" III.	359	529	170	415	510	95

The ration with the highest proportion of fat (turnip ration, 1909) yielded 1.11 lbs. of butter-fat for each pound of fat in the ration, that with the lowest (turnip ration, 1910-11), 1.59. On the other hand two rations with equal proportions of fat (ordinary ration, 1909, and turnip ration, 1911-12) yielded, respectively, 1.36 and 1.47 lbs. of butter-fat for each pound of fat in the ration. It has to be remembered, however, that the whole of the fat in any ration is not "digestible fat." In experiment III. (1911-12) the digestible fat in the turnip ration was equivalent to 171 lbs.—less than half the total fat—and that in the ordinary ration, 247 lbs. The excess fat produced and yielded in the milk weighed 358 lbs. in the case of Lot I., and 263 lbs. in that of Lot II.—a result which "appears to indicate that the easily digestible carbohydrates contained in the turnips are specially suitable for fat formation."

It is evident from the foregoing summary that cows can be made to produce, by suitable feeding, milk containing a considerably larger proportion than is given by them on the ordinary food. The question which remains to be considered is one of cost. This is answered by the following Table:—

	LOT I.			LOT II.		
	Turnip Ration.			Ordinary Ration.		
	Total milk, gallons.	Fat content, per cent.	Cost per gallon, (pence).	Total milk, gallons.	Fat content, per cent.	Cost per gallon, (pence).
Expt. I.	1,476	3.49	5.83	1,532	3.09	6.05
" II.	1,348	3.55	6.43	1,362	3.35	6.46
" III.	1,389	3.68	6.27	1,514	3.26	5.92

No allowance has been made for the value of the manure produced.

In every case the proportion of butter-fat is above the "standard" 3 per cent., and a comparison of the cost of production calculated on milk with that proportion of fat is still more favourable to the turnip ration. In the case of Lot I., the cost of production of the milk—on a 3 per cent. basis—was 5.01d., 5.4d. and 5.1d. in each successive experiment, as compared with 5.88d., 5.77d. and 5.43d. in the case of Lot II.

In 1909 (Experiment I.) weekly samples of the mixed milks were analysed, and on one occasion only was the butter-fat less than 3 per cent. (it fell to 2.96 per cent.) In 1910-11 Experiment II. the milk—according to analyses of "weekly composite samples"—never contained less than 3 per cent. of fat, night and morning. In Experiment III. (1911-12) analyses were made daily, and only once did the mixed milk fall below the standard (containing on that occasion 2.93 per cent.). Of 3,240 samples from the individual cows included in this experiment, 357 (22 per cent.) of the morning and 211 (13 per cent.) of the evening samples fell below the standard.

The results of the experiments appear to point to one irrefragable conclusion, viz., that the mixed milk of a herd of healthy cows should practically never contain less than the 3 per cent. of butter-fat—if the cows are properly fed.

NATIONAL INSURANCE ACT.—*Resident Medical Officers.*—Application having been made to the Insurance Commissioners for the determination of the question whether resident medical officers employed by hospital authorities to render professional services in hospitals are required to be insured under Part I. of the National Insurance Act, a public hearing was held on October 22nd, 1912, and the Commissioners have given the following decision:—

That resident medical officers at hospitals employed under the conditions referred to at the hearing on October 22nd, 1912, are not employed under a contract of service within the meaning of the National Insurance Act, and are accordingly not required to be insured thereunder, even if their rate of remuneration does not exceed in value £160 a year.

HONORARY DEGREE FOR DR. DAVIES.—On the occasion of the installation of Lord Haldane as Chancellor of the University of Bristol, the degree of LL.D. was conferred (*honoris causa*) on Dr. D. S. Davies, medical officer of health of the City of Bristol, and a past president of the Society of Medical Officers of Health.

SALE OF FOOD AND DRUGS ACT: SOME ADMINISTRATIVE DIFFICULTIES.

THE two difficulties which militate against the successful suppression of adulteration and substitution more than any other are (1) the small fines which are habitually imposed, and (2) the defence of warranty. The former hampers all work under the Act, the latter is rarely encountered, except in milk cases. The following paragraphs have been put together chiefly with regard to milk, but they are capable of a much wider application.

On the question of fines, it will be useful to recall the fact that in July, 1902, a circular letter was issued by the Home Secretary to the magistrates pointing out "the injurious consequences of the adulteration of articles of food . . . the large and sometimes enormous profits that accrue from the practice . . . when the penalty on detection is trifling, it not only fails to be deterrent, but may even spread the mischievous impression that the offence is venial." That it has been found necessary to issue a second letter (in January of this year), is ample evidence of the failure of the first letter to secure the desired end. In the latter letter the Home Secretary states, "Later figures . . . demonstrate the large proportion of cases still occurring . . . in which penalties are imposed of such a small amount as to suggest that the offence is regarded as being of an altogether trivial character." The following paragraphs on "pure milk," selected from a pamphlet, entitled "The Dairy Trade in London," recently received from a responsible dairy firm, are quoted as evidence "from inside" of some of the "tricks of the trade." It is doubtful whether any public official could frame a more serious indictment against unscrupulous vendors.

PURE MILK.

Few of the public are aware of the present legal regulations and of their failure in assuring that the purchaser gets what he pays for—genuinely pure milk.

At the present time a purveyor of milk can, day after day, serve his regular customers with milk and water, or separated milk—milk with all the cream extracted—added to genuine milk without fear of conviction under the present Food Adulteration Acts. A trader, guilty of this practice, if asked by a stranger or an inspector for milk, will serve him from a can of genuine milk, which he always carries in his cart or barrow. If the inspector demanded a sample from every vessel he had in his conveyance, which he has a perfect right to do, the vendor by immediately telling him the real quality—milk and water or milk plus separated milk—would be perfectly safe from prosecution, although the inspector was confident the man was retailing an adulterated for a genuine

article. Evasions of this description are very frequent. Further, a case came under the writer's observations, where an inspector stopped a trader as he had just served a customer and demanded a sample. At once he was told by the man he was selling milk and water. The inspector went to the customer and asked if she knew she had been served with milk and water, and was astonished to hear that if she was satisfied it was no business of his. Very creditable to her generosity, no doubt, but why should our laws allow such a loop-hole?

Several suggestions may be made as to how the law could be strengthened. *First.*—It should be made illegal for a milk carrier to sell or carry milk and water, or separated milk, at the same time as genuine milk. *Secondly.*—Every vessel should bear a label, in 4-inch letters, stating its contents, if not genuine milk. All such milk left at the early morning delivery should have a similar label in 1-inch letters on the can or bottle, or if served in customers' jugs a similar label to be handed to be purchaser. Practically, this means that only genuine milk should be sold as milk, as genuine butter only is sold as butter under the Margarine Act. The inspectors should be empowered to demand a sample after it has been left at the customer's door, if the request is made in the retailer's presence, as it is the property of the purveyor until taken inside the house of the purchaser.

A case occurring recently helps to show how necessary this power is. A carrier, with excellent references, was engaged by a large firm. He was a smart man, and consequently the routine method of sampling was useless, although the suspicions of the manager were aroused on several occasions. Four samples from cans left by him were tested and two were found adulterated with water which had been added after leaving the dairy. It is just as easy to tamper with milk left in bottles, for the discs closing the mouth are necessarily easy of removal.

The small retailer usually obtains his supplies from a wholesale dealer, and thus the genuineness of the article depends, in the first instance, on the honesty of the wholesaler. There are many obstacles to efficient testing when dealing with big contractors, but these would be greatly minimised if inspectors were empowered to sample any milk of any dealer, at any time, whether ordered or not, with instructions to delay delivery as little as possible, as time is a very important factor with the wholesale man. All churns containing separated milk, or milk and water, should be labelled with legible 4-inch letters when despatched to the retailer. The same should apply to all separated milk, etc., forwarded from factories or districts throughout the country. Some reformers even advocate a register of farmers or

dealers who supply separated milk, with power for the public inspector to demand the name and address of the purchaser, for there is not the slightest doubt that this milk is, in many cases, used for "standardising" genuine milk containing over the legal 3 per cent. of fats. It is not implied that this is a usual or even a frequent method of using separated milk, but it is not by any means uncommon. Of course, we are fully aware that farmers from certain known districts have the greatest difficulty in keeping their milk up to the 3 per cent. standard, but we are equally aware that there is plenty of milk produced containing 4 per cent. and more, and it is an easy matter for an unscrupulous dealer to reduce the latter to the Government standard and thus secure an enormously increased profit. Let us not forget that the legal percentage is the absolute minimum allowed.

Nothing shows the weakness of the Food Adulteration Act more than the great difficulty that public authorities have in securing convictions when the defendant relies on his so-called "Warranty." A dishonest trader has practically been able to defy the authorities and sell an impure article and to endanger the very existence of the infants when mothers depend upon him for their supply of milk. Everyone will agree that such a state of affairs is intolerable, and that no punishment is too drastic for offences which endanger the health of the future population. On several occasions it has been the privilege of the writer to be instrumental in securing convictions—two defendants suffered the maximum fine, and another four months' hard labour, but the matter ought not to be left to the private individual; it is a duty for the public authorities. At present, an unscrupulous trader buys his supplies from a wholesaler from whom he has little difficulty in obtaining a warranty. He can add 5, 10 or even 20 per cent. of water or separated milk, and if detected by an inspector selling the adulterated article and prosecuted, promptly produces his warranty before the magistrate and swears upon oath that he has sold the milk as received. Almost invariably the warranty is accepted as a good defence, and the wholesaler is prosecuted and, of course, the latter produces his warranty from the farmer. Here, if the case is in London, the prosecuting authority is powerless, for they have no jurisdiction over the country farmer, and the matter ends. Besides it is manifestly unfair that a farmer should be held responsible for the purity of milk which has passed through two, three, or even four traders before it reaches the ordinary customer, unless it can be proved on the soundest evidence, not necessarily in the witness box, that he is guilty of supplying an inferior article.

WARRANTIES.

The principal enactment under which summonses for adulterated foods are taken, is Section 6

of the Act of 1875, which reads as follows—omitting the provisos which are not material for present purposes—

"No person shall sell, to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance and quality of the article demanded by such purchaser, under a penalty not exceeding twenty pounds."

The section has been amended (a) as regards the meanings of the phrases "prejudice of the purchaser," and "nature, substance and quality," by Section 2 of the Act of 1879, and (b) as to penalties for repeated offences by Section 17 (1) of the Act of 1899.

Did the above-quoted section stand alone, it would be easy to secure a conviction in practically every case, as the vendor would be solely responsible for the genuineness of the commodity supplied. Difficulties have, however, been introduced through the interpretation given by the Courts to Section 25 of the Act of 1875—

"If the defendant in any prosecution under this Act prove to the satisfaction of the Justices or Court that he had purchased the article in question as the

summonses, taken by a Metropolitan Council, have been dismissed with respect to 14 samples of adulterated milk, the adulteration varying from 3 to 14 per cent. of added water, and 5 to 25 per cent. deficiency of butter fat or cream. Summonses against one vendor were dismissed on three occasions within twelve months on such plea, his samples proving to be deficient in fat on two occasions (5 per cent. on one, and 7 per cent. on the other), and to contain 13 per cent. of added water on the third. Another vendor was successful with the same defence twice in four years—the first sample (the third taken within two months, convictions having been obtained with respect to the two previous samples) containing 3 per cent. of added water and 14 per cent. less than the proper proportion of fat, and the second 14 per cent. of added water. This same vendor was summoned this year with respect to a sample with 9 per cent. deficiency in fat, and successfully pleaded his warranty. (The costs to the Council in this last case amounted to over £30). In other

	No. of Sum- monses taken out.*	No. dismissed.		No. of convic- tions obtained.	No penalty imposed.	Total amount of fines and costs.	Average per conviction.	
		Total.	On Warranty.				Fine.	Costs.
1906	45	5	4	40	5	£ s. d. 63 1 0	£ s. d. 0 16 6	£ s. d. 0 15 0
1907	29	7	7	22	2	31 16 6	0 17 0	0 12 8
1908	37	3	3	30	16	55 17 6	1 2 3	0 13 9
1909	52	3	3	49	6	86 6 6	1 3 9	0 12 2
1910	46	—	—	41	9	125 8 6	2 3 8	0 12 2

* Total number of summonses taken out for offences of all kinds under the Act's.

same in nature, substance and quality as that demanded of him by the prosecutor, and with a written warranty to that effect, that he had no reason to believe that at the time when he sold it that the article was otherwise, and that he sold it in the same state as when he purchased it, he shall be discharged from the prosecution."

The procedure requisite to securing a successful plea of warranty has been defined by Section 20 (1) of the Act of 1899, which reads—

"A warranty or invoice shall not be available as a defence to any proceeding under the Sale of Food and Drugs Act unless the defendant has, within seven days after service of the summons, sent to the purchaser a copy of such warranty or invoice with a written notice stating that he intends to rely on the warranty or invoice and specifying the name and address of the person from whom he received it, and has also sent a like notice of his intention to such person."

The last-named Section also extends the protection to the servant of any person holding the warranty, when the former is summoned for the sale of any commodity referred to in such warranty.

A plea of warranty is rarely relied on except in the case of milk. During the five years, 1907-11,

cases vendors have secured the dismissal of summonses on such defence, although previous convictions under the Acts on record against them, suggested (to say the least) that the adulteration was deliberate. The above table shows (among other points) the number of cases in which the warranty defence was successfully relied on during 1906-10.

Section 25 of the Act of 1875, provides for a "written warranty," which, contrary to first impressions, need not be a formally executed document. This is borne out by the decision of the Divisional Court in *Watts v. Stevens* [(1906) 70, J.P. 418]. In that case the warranty was an informal letter written to the consignee some days after the execution of the contract of sale. It is, however, essential that "the language of the document imparts a warranty, and shows an intention on the part of the vendor to warrant" (*Charles J., in Laidlaw v. Wilson, L.R., Q.B. 74*). It has since been held (a) that the invoice, and (b) that the label can be held to be sufficient

warranties. The former point was decided in *Hawkins v. Williams* [(1895) 59 J.P. 533], and the latter in *Lewis v. Wetheritt* [(1909) 73 J.P. 164]. In this last-mentioned case the contract of sale had run out, and the only warranty current was that of the label. The general result is that a defence of warranty based on a label embodying some phraseology such as "warranted pure milk with all its cream," will be successful if the vendor of the sample satisfies the Court that he sold the milk as he received it. There will remain the possibility of proceeding against the giver of the warranty, but the difficulties associated with such proceedings are even greater than in the case against the original vendor. If the farmer proves to the satisfaction of the Court that he delivered the milk as given by the cow, he cannot be convicted. Adulteration can be proved, but where a warranty—and more especially a series of warranties—is pleaded, no one can be made responsible for the adulteration.

The adoption of a milk standard by the Board of Agriculture, in pursuance of Section 4 of the Act of 1899, was expected to make it easier to secure the provision of milk of a reasonably good quality. Here, again, difficulties have arisen, firstly because—as evidenced by the Reports of the Board—a section of the milk vendors mix high and low quality of milks, and instead of supplying a good quality of milk, supply one just complying with the (admittedly low) standard. Again, the so-called standard is not a real standard. Milk which falls below it is not, of necessity, to be condemned as adulterated—*Smithies v. Bridges* [(1902) 66 J.P., 740]. No conviction can be obtained if it can be shown that the milk—no matter of how poor a quality—was, in composition, exactly as it came from the cow. In one case at least a cow has been known to give milk containing 12 per cent. of added water, when judged by the standard.

On this point the following quotation from an Editorial published in the *Justice of the Peace* [(1905) 69 J.P., 183], is instructive:—

"We may summarise the state of the law as follows:—If the analyst certifies that milk contains less than 3 per cent. of fat, and 8.5 per cent. of other solids, there is a presumption that the milk has been adulterated, or that there has been an abstraction of cream. This presumption can be rebutted by showing that the milk has not been tampered with. But notwithstanding this evidence it is still open to the justices to convict, if they think that for any other reason the alleged milk is not of the nature, substance, and quality demanded. On the other hand, if the prosecution could, in fact, show that the milk had been watered, or the cream abstracted, the defendant would have a good answer to a complaint against him under Section 6 of the Sale of Food and Drugs Act, 1875, if he could show that the milk was up to the low standard of the Board of Agriculture. This is rather a paradoxical state of matters, but some escape from it may be found in Section 9 of the above Act. The law as it stands at present is by no means unfavourable to the vendor, even if he should occasionally be convicted of selling milk as it came from the cow."

In 1903, circular letters were addressed to a large number of sanitary authorities, asking what their experience had been with regard to warranties. All, or nearly all, had found that the warranty provisions of the Acts (Section 25 of the Act of 1875) had rendered it very difficult to check the sale of adulterated milk.

At the present time proposals are being considered for amending legislation with regard to milk. It seems to be desirable that the attention of the Government should be called to the question in no uncertain terms. While it is very undesirable that any change should be made in the law which would press hardly on honest traders, it is essential that more rigorous measures should be established against the dishonest. If the warranty clauses were repealed, the vendor of the sample would be the person responsible for its purity. He would not be able to pass that liability on to someone else as he does at present, with the result that the adulteration cannot be brought home to anyone. Honest traders can protect themselves by properly executed contracts, which will enable them to obtain substantial damages by civil procedure if there be any infringement of the contract. At the same time it should be pointed out that there is no real difficulty in taking proper precautions to regularly and systematically test the quality of the commodity supplied under contract. It may also be added that local authorities would be ready at all times to help such persons in their endeavours to provide genuine food-stuffs.

The present state of administration is well summed up in the following extract from an Editorial in the *Justice of the Peace* [(1911) 75 J.P. 590].

"The law in regard to the giving of milk warranties cannot be regarded as being in a satisfactory state. It certainly opens a door through which watered milk can be supplied to the public while the real offender escapes. In practice, what commonly happens is that a sanitary inspector takes a sample from a retail vendor in a large town. On analysis the milk proves to be adulterated with water. Proceedings are taken against this vendor, he pleads that he purchased the milk from a large firm or company of milk dealers with a written warranty as to its purity. He further proves that he had no reason to believe at the time when he sold it that the article was otherwise than pure milk, and that he sold it in the same state as when he purchased it. If he does this and complies with certain provisions as to giving notice, he cannot be convicted."

"The next step for the inspector under the Acts to take is to summon the firm or company who gave the warranty, under Section 20 (6) i.e., of the Act of 1899. That sub-section makes every person who gives to a purchaser a false warranty in writing liable to conviction and fine unless he proves to the satisfaction of the Court that when he gave the warranty he had reason to believe that the statements or descriptions therein contained were true. If he can do this he also escapes. The defence which the firm or company may raise is that they bought the milk from a farmer with a warranty, and that they had not found any reason to distrust him. In a very recent case, *Dairy Supply Company, Limited, v. Houghton* [(1911), 75 J.P.N. 580],* this defence was successfully set up."

*The full report is given in 76 J.P., 43.

"There is the farmer left, but by this time the six months' limitation under the Summary Jurisdiction Act, 1848, has probably elapsed, so that no proceedings can be taken against him. The result is that although watered milk has been sold, no one has been found liable in respect of it. Unless innocent persons are to be convicted there appears no escape from the difficulty. It is impossible, of course, to test every consignment of milk that is sent into a large town on any particular day, and even if samples were taken they could not be analysed in time to stop delivery. It is, however, quite usual for innocent persons to be made liable for selling unsound food, and we do not see why the defence of warranty, at least as regards milk, should not be abolished in proceedings before a court of summary jurisdiction."

"Such an abolition would indeed cause some hardship in respect of innocent vendors; but it would, in the end, lead to greater care being taken by them, and would prevent a great deal of fraud by persons who are only too glad to avail themselves of every loophole in an Act of Parliament."

FINES.

The amount of the fine inflicted by the Court has an important bearing on the problem of stopping the sale of adulterated foods. It is provided by Section 6, of the Act of 1875, that the fine on conviction shall be a sum not exceeding £20. By Section 17 (1), of the Act of 1899, the Court can impose a fine not exceeding £50 for a second offence and one not exceeding £100 for any subsequent offence. Further, by Section 17 (2), of the last-named Act:

"Where, under any provision of the Sale of Food and Drugs Acts, a person guilty of an offence is liable to a fine exceeding £50, and the offence, in the opinion of the Court, was committed by the personal act, default or culpable negligence of the person accused, that person shall be liable (if the Court is of opinion that a fine will not meet the circumstances of the case) to imprisonment, with or without hard labour, for a period not exceeding three months."

Adulteration will be stopped as soon as it becomes unprofitable. The profits accruing from undetected adulteration are very large, and the only way to make the practice unprofitable is to impose really substantial penalties. The appended tabulation of the results of summonses taken out under the Acts during the five years, 1906-10, affords sufficient proof of the failure to render adulteration unpopular by reason of the heavy penalties imposed on convictions being obtained.

NOTES.

- 1906—Maximum fine £5 [on 8th summons (1899-1904)]: 6 ending in convictions; 2 dismissed on warranty. Six (6) of defendants had previous convictions on record against them.
- 1907—Maximum fine £5 (on 2nd conviction). Four (4) of the defendants had previous convictions on record against them.
- 1908—Maximum fine £10 (3rd conviction on same day). None of the defendants had previous convictions on record against them.
- 1909—Maximum fine £5 (for two offences with respect to one sample). Four (4) of the defendants had previous convictions on record against them.
- 1910—Maximum fine £20 or 2 months (twice, same defendant, same day). Six (6) of the defendants had previous convictions on record against them.

INTERCEPTING TRAPS.*

THIS report makes most interesting and even, though the title hardly suggests it, fascinating reading. That it is well written need hardly be said, as practically all Local Government Board reports are so. The report is signed, by the late Dr. Darra Mair, Mr. Alan Malet, Mr. H.G. Pearson, and Mr. E. H. Terry, Members of the Committee appointed by the President of the Local Government Board to hold the inquiry the first named being Chairman, and the last Secretary.

But it is something more than well written; it has an easy style and flow, and one is carried along, reading and approving the experiments and the conclusions drawn from the results obtained,—until the end; for at the end, where one had expected to read that the only conclusion possible is that the interceptor, in addition to being valueless, is in the highest degree objectionable, and a definite statement to the effect that the byelaw requiring its introduction should be omitted from drainage byelaws, one sees a desperate hunt on the part of the Committee for instances in which it may be useful, and a leaving of the whole matter to local authorities to decide for themselves.

Despite the weakness of the ending, or rather because of it, since he will have to be acquainted with all arguments for and against the interceptor, every medical officer of health will have to read the report. When he comes to do so he will find that it contains some 77 pages, and consists of eight parts, besides an introductory and general section, and five appendices.

One of the appendices gives the names of the witnesses, many of whom were medical officers of health, conspicuous amongst these being Dr. Butler, lately of Willesden, who was largely responsible for the inquiry. His experiments and opinions are frequently referred to in the report, as are those of Mr. Patten Barber, surveyor of Islington, Dr. Andrews, of St. Bartholomew's Hospital, and Dr. Haldane.

Part I. deals with the disadvantages of the intercepting trap. It shows that this appliance is always an obstacle to the free flow of the sewage; that it retains anything up to 79% of the solids in that sewage; that it is exceedingly liable to blockage, the fact that it is blocked being usually unrecognised; that the fresh air inlet connected with it is quite unnecessary and generally a nuisance if not a danger to health, and that by omitting the trap the whole drainage system can be greatly simplified. Information is also given showing that when a trap is introduced, one of three inches is to be preferred, and iron drains should be used and the channels in the manholes covered and not left

*Report of the Departmental Committee appointed by the President of the Local Government Board to inquire and report with regard to the use of Intercepting Traps in House Drains. [Cd. 6359]. 1912.

open as they usually are. These recommendations are made with the object of bringing blockages of the drain earlier to the notice of the householder than would be the case if the manholes were left free to act as reservoirs for considerable quantities of the sewage.

Part II. sets out the advantages claimed for intercepting traps. These are two in number, viz.: that they act as barriers to rats and prevent the passage of sewer air back into houses. Both of these advantages are, however, discounted, since it is shown that rats can and do negotiate traps and that, provided the drains are properly constructed, any sewer air passing into the drain can only escape through a ventilating shaft, this being the easiest exit. If any portion does reach the interior of the house, it is wafted there from the top of the shaft. Some very interesting experiments to show that only very exceptionally can the seal of the intercepting trap, and in the absence of such a trap, that of any other of the house traps be forced by pressure in the sewer, are described.

The chemistry and bacteriology of sewer air are considered in Sections III. and IV., and numerous quotations from the work of Dr. Haldane and Dr. Andrews are made. These workers, as is well known, showed that there was no very remarkable difference between the air in sewers and that outside. It might contain more CO_2 and occasionally a trace of sulphuretted hydrogen, a really dangerous gas, but though, especially when there was splashing, sewage organisms might escape, usually only ordinary bacteria of the air were detected, and never disease germs. Epidemiologically, in short, sewer air was harmless, and the only thing that could be argued against it was that it occasionally had a bad smell, which injuriously affected persons susceptible to smells.

These smells, it is held, are due to indol, skatol, the mercaptans and compound ammonias, and arise mostly, not from the sewage, but from decomposing moulds and fungi on the walls of the sewers. These two sections go to prove that if the intercepting trap were abolished, and sewer air did get into a house, it would do practically no harm.

Views with regard to drain air are given in Part V., the experiments of Dr. Andrews, Major Horrocks, who made qualitative bacteriological examinations, and of Professor Winslow (Massachusetts Institute of Technology), who made quantitative investigations, being quoted and described. The conclusions arrived at are that bacteriologically there are graver risks to any household from the air from their own drains than from that in the sewers, whether there is an interceptor or not.

Diffusion even of disease germs, throughout the drain to the top and out of the ventilation shaft,

especially if there is splashing of the contents, and there always is in drains whenever there is discharge into them, may readily occur, and is likely to be increased rather than diminished by the introduction of an intercepting trap.

Part VI. is headed "General Evidence" and brings out that no one, not even sewer men, were ever really seriously damaged by sewer air, and that no epidemic illness has ever been traced to it. Delépine's experiments, which proved that guinea pigs which breathed nothing but sewer air were no less healthy than others breathing the ordinary air, are quoted, as are also the Leeds investigations, which revealed the fact that enteric fever and other infectious diseases occurred just as frequently in houses with sound drains as in those in which demonstrable defects were noted.

A study of Part VII.—Ventilation of Sewers—leads to the conclusion that if ventilators are necessary, the more elevated they are the better, if nuisance from smell is to be obviated.

Both for the purpose of preventing the forcing of traps and making the sewers safe for the men who work in them, the necessity of sewer ventilation has, it is stated, been over-estimated. Practically all that the street ventilators do is to allow of the escape of unpleasant smells. Intercepting traps are practically never forced by pressure; do away with them completely and this consideration need no longer be regarded. With regard to the safety of the men, even now the existing ventilators are not depended upon in this connection, since the sewer, in many places, is always made ready, by leaving some of the man-hole covers off for about an hour before the men enter. If all street ventilators were closed, and intercepting traps omitted, the conclusion seems to be that everything would be satisfactory. Even if the traps were left in, it is probable that, as regards ventilation, equally good results would be obtained, as sewers are practically never air-tight, and outlets and inlets sufficient to prevent any excessive pressure would readily be found.

The eighth part contains a summary and conclusions. The unsatisfactory nature of these last has already been noted, and the reasons for objecting to them will be gathered from the summary given above.

In the appendices some of the experiments referred to in the text of the report are more fully described, and in some instances illustrated.

The advice given at the beginning of this review to read the report may, in conclusion, again be mentioned.

OBITUARY.

We much regret to announce the death of DR. L. W. DARRA MAIR, late medical inspector of the Local Government Board and Fellow of the Society of Medical Officers of Health.

ANNUAL REPORT OF THE MEDICAL OFFICER OF HEALTH OF GLASGOW FOR 1911.

DR. CHALMERS reports that during the last 40 years there has been a reduction of 10 per cent. in the marriage-rate, and 38 per cent. in the birth-rate; while during the last 30 years there has been a decline of 68 per cent. in the death-rate. The death-rate of Glasgow is now 17.7, midway between that of 15.7 in London and 20.0 in Liverpool. The three chief lines of action adopted by the Health Committee of the Corporation of Glasgow for diminution of the death-rate—infant mortality, tuberculosis and housing—are the subject of three special reports which are included in this volume, and are worthy of special consideration.

HOUSING.—The report on "The House Accommodation of the Labouring Classes" is perhaps the most original and important. Glasgow has for some years realised the important relation of health to housing and the amount of lee-way to be made up in this respect; the work done stands out conspicuously amongst the heroic efforts of all our greater cities to cleanse their Augean stables. During the past twenty years nearly 1,000 houses have been demolished under the Glasgow Police (Amendment) Act, 1890, 773 under the City Improvements Act, 1897, and 1,539 under the Housing of the Working Classes Acts, 1899-1909. But since 1909 all action has been taken under the Housing and Town-Planning Act, 22 representations being made in 1910, resulting in 8 demolitions, 11 closures, 1 conversion, while 2 closing orders failed and withdrawn. But it will be remembered that the term "house" in Scotland corresponds to what in England is termed a "tenement," and more than half these "houses" are of one apartment only. Much, therefore, remains to be done. This year, in his report on tuberculosis, the medical officer of health believes that opinion is gaining fairly wide acceptance which holds "that, unless the movement for the reduction of consumption begins on the basis of reform in the conditions of housing, time will be lost, and disappointment result."

Two years ago, therefore, the Corporation took the housing problem up in earnest, and referred to the Health Committee an instruction "to consider and report as to the necessity (in the matter of public health) for the immediate removal, so far as this can be done under existing legislation, of all insanitary and obstructive buildings in congested areas of the city." A systematic survey of certain wards, selected for their high death-rate, was accordingly made, and the report shows the care and completeness that would be expected from its author.

The conditions found prejudicial to health are divided between those internal and those external. Both are illustrated by clear full-page or double-page ground-plans of typical examples, the larger being coloured. The main internal defects of design are specified as follows:—

- (1) Common lobbies defective in lighting and ventilation;
- (2) Concealed beds;
- (3) Houses (or tenements) with windows only on the same outside wall, so that, when the doors into the lobbies are shut, there is no through-ventilation, and they are functionally back-to-back;
- (4) Houses (or tenements) actually back-to-back.

The external defects are well described as those of "over-building," and frequently result in the insufficiency of free space opposite the windows of sleeping apartments—a defect punishable under the Glasgow Building Regulations Act by fine. A survey in 1902 showed that 5,470 apartments were faulty in this respect; a recent survey shows the number to be 3,079, the reduction being mostly effected without the use of the above Act by demolition of the rooms or conversion to other purposes. The chief types of over-building may be thus grouped:—

- (1) Streets too close together;
- (2) Streets too narrow;
- (3) Buildings too high;
- (4) Quadrangles between boundary streets more or less built over.

"In all these cases the results are such as may be anticipated. Buildings so situated are mutually obstructive; there can be no effective through-ventilation of the areas on which they have been erected, and the lighting of rooms on the opposed sides of tenements close to each other is defective. The only variation is in the degree to which both occur, and this is determined by the height and proximity of adjacent blocks."

Apart from expense, however, the legal powers as to demolition are not wholly sufficient. In some circumstances there is no power to prevent even more obstructive buildings being erected in the place of those demolished; for town-planning under the 1909 Act is confined to "lan" which is in the course of development or appears likely to be used for building purposes." This disaster is especially liable to occur where, as hitherto, selective demolition of the worst buildings in respect of structure and situation has been aimed at. Experience has shown that it has only a limited utility even where it is successful, and that it may fail in circumstances where success would appear certain. It must also be taken into account that the official standard of unfitness for human habitation is at the moment considerably

in advance of that which is accepted in a court of law. It is a further disadvantage of this selective method that when tenements of dwelling-houses are intermingled with business premises in the same enclosed area the procedure adopted is not equally applicable to both.

A useful and necessary reminder is given in the report of the fact that the provision of open spaces on the margin of over-built areas fails to accomplish for the population resident within them as much as is to be expected from opening out the intervals between the tenements themselves. The famous Cowcaddens remains one of the most unhealthy districts, despite the propinquity of Phoenix Park.

Multiple ownership and the complex questions that then arise as to compensation present a further difficulty; but it is suggested that Section 15 of the 1909 Act might enable schemes for reconstruction to meet the case, without recourse to any drastic improvement scheme under Part I. of the 1890 Act. In any case the first necessity is to get rid of the buildings which obstruct the "hollow square," and to secure the through ventilation of the enclosed area by the provision of openings in opposite sides of the containing walls of tenements. If an annual sum be voted for these purposes, Dr. Chalmers believes that the worst districts would be completely changed for the better within a few years.

Incidentally we may perhaps suggest that the condition of those now so defectively housed is likely to profit materially from the operation of the "Glasgow Garden Suburbs Tenants, Ltd.," a product of the co-operative housing movement, so successful elsewhere, which with a capital of £50,000 and an influential committee of management has obtained an option over several hundred acres on the outskirts of Glasgow at Garscube.

TUBERCULOSIS.—Space fails in which to do justice to the special report of 40 pages on tuberculosis. In 1910, in a population of 784 thousand, 1,308 cases were notified from private practice, 1,271 from poor-law practice, 726 from municipal or charitable institutions; and in all there were 3,590 cases, giving an attack rate of 4.5 per 1,000, with a fatality, probably over-estimated, of 31 per cent. An analysis of 569 cases attending the dispensaries shows that 23 per cent. were children of school-age; the numbers of early, intermediate and advanced cases in the males were equal; although there were rather fewer females amongst early and more amongst the advanced cases; one-fourth of the cases notified were not phthisical; and in only 33 per cent. of sputa sent for examination was the bacillus found.

Only 35 per cent. of the patients were earning over 5s. per week, after deducting rent, while 25 per cent. earned under 3s.

31 per cent. had separate sleeping rooms, but 47 per cent. slept with others in the same bed.

It is urged that consumption demands permanent alteration of habits rather than isolation; and the value of a hospital for consumptives, of country homes and of open-air schools for pre-tuberculous children is extolled, while that of sanatoria is regarded as of limited scope.

INFANT MORTALITY.—It is noticeable that the large Scottish cities have a lower rate than the large English cities except London, and that Glasgow, with a rate of 139 in 1911 and 135 for the last decade, has a rate considerably lower than Liverpool, Manchester or Birmingham. The system of health-visiting produced last year some results of interest. Of over 22,000 births notified, 902 were still-births; and nearly 6,000 infants were visited. Not 5 per cent. were being artificially fed at the first visit. The Glasgow Infant Health Visitors' Association supplied voluntary visitors, who continued visits throughout the year to children requiring observation; and infant consultations were held periodically at eight centres. Intimation was given to H. M. Inspector of Factories and Workshops of 1,417 mothers employed, one-fourth in respect of illegitimate births.

A most interesting report is given in full from a deputation to the Third International Congress on Infant Mortality in Berlin on the lessons of the Congress and on the administration and value of the various measures and institutions existing in the German capital in connection with infant mortality, the movement for the reduction of which is part of a national movement for youthful welfare in general.

INFANTILE MORTALITY: SUMMER, 1912.—According to the figures published in the Registrar-General's Report for the third quarter of the current year, the infantile mortality for that quarter was at the rate of 79 per 1,000 births registered. The rate was 61 per 1,000 below the corresponding rate for 1902-11, and 122 per 1,000 less than the rate for 1911 (third quarter). "In that quarter the weather was hot and dry, and it was pointed out at the time, that, allowing for the abnormal meteorological conditions, the high infantile mortality was not inconsistent with the opinion that there has been a genuine reduction of infantile mortality during recent years. This view is supported by the fact that in the quarter under notice, when the meteorological conditions were of an opposite character, the rate of infantile mortality was not only the lowest recorded in any third quarter, but was also the lowest in any quarter since the year 1870—the first year in which records of quarterly mortality were kept."

In administrative counties the lowest recorded rate for the quarter was that of Dorsetshire (44) and the highest, that of Lancashire (99). In the 95 great towns the rate averaged 86, with a minimum of 35 in Southport and a maximum of 166 in Wigan. In the 146 smaller towns, the average rate was 78, the minimum being recorded in Hendon, and the maximum 170 in Hindley. In London (County of) the rate was 81, with a minimum of 47 (Chelsea) and a maximum of 140 (Shoreditch).

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856.

RECONSTRUCTED 1888.

INCORPORATED 1892.

THE ADJOURNED ANNUAL GENERAL MEETING of the Society was held at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, November 8th, 1912, at 5 p.m. Present: Professor E. W. Hope (in the Chair), Drs. Charles Porter, A. W. Harris, John Tubb-Thomas, S. C. Lawrence, W. G. Willoughby, E. H. Snell, Ridley Bailey, F. J. Allan, J. R. Kaye, Alex. Anderson, P. Caldwell Smith, G. F. Buchan, William Butler, T. W. N. Barlow, Charles Sanders, R. H. Wilshaw, John Tate, A. Ball, P. W. Spaul, J. J. Buchan, F. Robinson, J. Howard Jones, H. Scurfield, R. E. Lauder, R. Dudfield, W. A. Bond, A. B. McMaster, Herbert Jones, E. F. Thomas, W. J. Butcher and Professor A. Bostock Hill.

The Accounts and Balance Sheet for Session 1911-1912 were received, and on the motion of Dr. J. Tubb-Thomas, seconded by Dr. Sanders, Mr. John Hamp was re-appointed the Society's Auditor for Session 1912-1913 at the same fee as previously.

ORDINARY MEETING.—On the conclusion of the adjourned Annual General Meeting an Ordinary Meeting took place; Professor E. W. Hope in the Chair. The Minutes of the previous Ordinary Meeting held on April 19th, 1912, were taken as read, having been published in *PUBLIC HEALTH* (May, 1912, p. 317), and were approved and duly signed by the Chairman.

ELECTION OF FELLOWS.—The following candidates who had been duly nominated were balloted for and declared elected:—

Ram Swarup Agrawal, L.R.C.P. and S., D.P.H., Barooni Khandag, Lucknow, India; Charles A. Bignold, M.A., M.B., B.Sc., County Buildings, Ayr; Robert Clarke, M.D., D.P.H., Ruthers Villa, Rutherglen; William Duff, M.B., C.M., Orchard Villa, Wishaw; John Bell Ferguson, M.B., Ch.B., D.P.H., Town Hall, Leicester; Richard Hamilton, M.B., C.M., D.P.H., Craigielea, Dundee Road, Coatbridge; Albert Hilton, L.S.A., D.P.H., Longshuts, Hurst, Ashton-under-Lyne; James C. Hoyle, M.B., D.P.H., Tylers Lodge, Upham, Southampton; Arthur G. Jenner, M.R.C.S., L.R.C.P., D.P.H., Town Hall, Burton-on-Trent; John Everard Linnell, B.A., M.B., D.P.H., The Point, Sheringham, Norfolk; Ralph M. F. Picken, M.B., B.Sc., D.P.H., County Health Office, Darnley; W. S. J. Robertson, M.B., Ch.B., D.P.H., City Hospital, Edinburgh; Frank E. Scrase, F.R.C.S., L.R.C.P., D.P.H., Town Hall, Haverstock Hill, N.W.; John Teare, M.D., D.P.H., 7, Westridge Road, Southampton; Wyville S. Thomson, M.B., Ch.B., D.P.H., Isolat on Hospital, Leicester; Sydney A. Tucker, M.B., B.S., D.P.H., Hanover House, Queen Victoria Road, Coventry; E. A. Freear Wilkes, M.R.C.S., D.P.H., Delamere, Wallis Road, Basingstoke, Hants; Bernard D. T. Wright, M.R.C.S., L.R.C.P., Coltishall, Norfolk; G. Pratt Yule, M.D., F.R.C.P., B.Sc. (P.H.), Cupar, Fife.

The Hon. Secretary read a list of nominations to the membership of the Society.

Dr. Harold Scurfield read a paper upon "The need for infant management being given a more prominent place in the medical curriculum."* The following took part in the subsequent discussion:—Professor E. W. Hope, Drs. Dudfield, Meredith, Professor A. Bostock Hill, F. G. Fremantle, F. Vacher, W. A. Bond, A. M. N. Pringle, Fairfield Thomas, H. Beale Collins, C. Sanders, W. J. Butcher and A. H. Bygott. At the conclusion of the discussion it was resolved, on the motion of Dr. Scurfield, "That it be referred to the Council of the Society to consider the best methods of securing that (with a view to the reduction of infant mortality), the subject of infant management be given a more important place in the medical curriculum."

Metropolitan Branch.—A meeting of the Metropolitan Branch was held at No. 1 Upper Montague Street, Russell Square, W.C., on Friday, 22nd November, 1912, at 4 p.m.

Present, Sir Shirley F. Murphy (in the Chair), Drs. Bryett, Butler, Dudfield, Fawcus, Harris (A. W.), Parkes, Caldwell Smith, Spaul and Porter (Hon. Secretary). A number of visitors including H. Percy Boulnois, Esq., Chairman of Council The Royal Sanitary Institute, Arthur J. Martin, Esq., and James Gair, Esq., also attended.

The minutes of the previous meeting were read and confirmed.

The chief business of the meeting was a discussion on the Intercepting Trap and the report of the Departmental Committee, which was opened by Dr. Butler.

The discussion which followed was taken part in by all the visitors and members present. Dr. Butler replied to the various speakers, and on the motion of Dr. Parkes a unanimous vote of thanks was accorded to him for having brought the subject before the meeting.

Southern Branch.—A meeting of the Southern Branch was held at the Town Hall, Portsmouth, on Friday, November 1st. There were present Dr. Gibson (President), Drs. Lauder, Willoughby, Livingstone, Clark, Walker, Wilshaw Forbes, and Fraser (Hon. Secretary), and 1 Dr. Butcher as a visitor.

The discussion on the relationship of medical officers of health to the National Insurance Act was continued, and the following resolutions were unanimously adopted:—

(1) That the medical officer of health shall be the administrative officer for dealing with tuberculosis within his area under any scheme, and shall be the medical adviser to the Local Insurance Committee.

That the tuberculosis officer, when appointed, shall be on the staff of the medical

*To be published in the January number of *PUBLIC HEALTH*.

officer of health, and shall be under his administrative control, except as regards clinical work.

(2) That this Branch cannot agree with any resolution which will debar tuberculosis medical officers from treating patients at the dispensaries.

(3) That the medical officer of health, as medical officer of health, does not desire to treat tuberculosis patients.

(4) That the position and responsibility of the district medical officer of health shall be fully recognised in the tuberculosis scheme of any area.

(5) That where clinical control is exercised by a medical officer of health over a considerable proportion of insured consumptives from his area during sanatorium or hospital treatment it is desirable that the medical officer of health shall be appointed tuberculosis medical officer to the Local Insurance Committee.

(6) That in the event of a Conference being arranged between the State Sickness Insurance Committee and the Society of Medical Officers of Health it is important that medical officers of health of an administrative county, a large county borough, a small county borough, urban and rural districts respectively shall be included amongst the representatives appointed by the Society of Medical Officers of Health.

It was resolved that these resolutions be forwarded to the Council of the Society forthwith.

Dr. James Fairley and Dr. W. J. Butcher were elected members of the Southern Branch.

It was decided to hold the next meeting at Chichester.

Midland Branch.—A meeting of the Branch was held at the Council House, Birmingham, on Thursday, November 7th, at 3.30 p.m.

Present:—Dr. J. Doig McCrindle (in the chair), Drs. Ridley Bailey, J. M. Cowie, A. G. Jenner, Ernest Hill, C. E. Tangye, H. Gibbons Ward, Mabyr Read, M. Gepp, T. Orr, R.W. H. Jackson, George Reid, John Robertson, A. Bostock Hill, Henry Malet, Sydney Barwise, Armly Ashkeny, G. A. Auden and E. H. Snell.

Apologies for absence were received from Drs. Henry May and Henry Handford.

A discussion was opened by Dr. Malet, on "A criticism of the attitudes of the medical officer of health and the general practitioner on the Astor Scheme." The following joined in the discussion: Drs. E. H. Snell, S. Barwise, George Reid, Mabyr Read, Ridley Bailey, A. Bostock Hill and the President; and Dr. Malet briefly replied.

North-Western Branch.—A meeting of the Branch was held at the Grosvenor Hotel, Manchester, on Friday afternoon, November 15th,

Dr. Meredith Young being in the chair, and 38 other members present.

Apologies for absence were received from Drs. Hope, Niven, Peck and Brindley.

A vote of condolence was passed with the relatives of the late Sir William J. Sinclair, who was an Associate Member of the Branch, and had often attended its meetings, especially when any subject connected with the control of Midwives was under discussion.

Dr. J. J. Buchan (St. Helens), introduced a discussion on the "Administration of the Sanatorium Benefits under the Insurance Act, and the positions of the various officers in connection therewith." A long and interesting discussion took place, in which Drs. Marsden, Sergeant, Fairfield Thomas, Dowling, Rees Jones, Coote Hibbert, Stephenson, Allen Daley, Barlow and Young took part, and Dr. Buchan replied.

In the evening the Annual Dinner of the Branch was held at the Midland Hotel, Manchester, at which 42 members were present, a most enjoyable evening being spent.

Home Counties Branch.—The second meeting of the session 1912-13, was held at the Society's Rooms, 1 Upper Montague Street, Russell Square, W.C., on Wednesday, the 13th November, 1912, at 4 p.m.

Present:—Dr. W. J. Howarth, President (in the chair), Drs. A. E. Porter, D. J. Thomas, J. Williamson, George H. Duport, Sophia B. Jackson, Helena A. Hall, S. C. Lawrence, C. Sanders, J. M. Clements, A. Ball, J. Tate, H. D. West, S. G. Sloman, Beale Collins, A. A. Ashby, R. W. C. Pierce, J. R. Prior, T. Strain, and George Buchan, Hon. Secy. The Treasurer, Dr. Ashby, presented his Annual Statement for the Session 1911-12, showing a balance at the bank of £139 8s. The accounts were duly audited and certified as correct. A discussion on "The Control of Tuberculosis" was opened by Dr. Howarth, in the absence of Dr. Fremantle.

The following took part in the discussion:—Drs. Sanders, A. E. Porter, Lawrence, Beale Collins and Buchan. Drs. Howarth and Lawrence replied.

NOTE ON ACCOUNTS, 1911-1912.

The Income of the Society during the past year (1911-1912) amounted to £1,788 10s. 3d., and the Expenditure to £1,758 18s. 5d. In comparison with the previous year the Income was £3 7s. 6d. lower and the Expenditure £60 os. 7d. lower. Last year there was a Balance of Income over Expenditure amounting to £29 14s. 10d., and in the previous year a deficit amount to £27 1s. 3d. It should be noted however, that last year the usual sum of £50 was not carried to the reserve account. If that had been done the Balance of £29 14s. 10d.

would have been converted to a deficit of £20 5s. 2d.—so that last year's account shows a slight improvement. Below will be found a comparison of the principal items of Income and Expenditure for each of the past three years, taken from the Annual Revenue Accounts:—

INCOME.											
	1909-10.			1910-11.			1911-12.				
	£	s.	d.	£	s.	d.	£	s.	d.		
Totals..	1,812	4	4	1,791	7	9	1,788	10	3		
Subscriptions..	895	3	6	925	3	6	944	14	6		
„ Arrears	91	17	6	107	12	6	75	1	6		
Dividends ..	129	8	8	130	19	4	132	11	8		
Advertisements	547	11	4	503	7	5	449	2	4		
Sales (Journal and Reprints)	105	8	4	117	3	0	178	18	3		
EXPENDITURE.											
Totals..	1,786	1	10	1,858	9	0	1,758	18	5		
Central Office & Administration.	610	18	9	646	19	5	644	17	7		
Journal Acct.: Editorial Charges ..	112	8	4	116	6	1	114	13	8		
Printing and Publishing.	515	18	8	599	9	10	526	0	10		
Advertisements.	136	17	10	125	16	10	110	0	7		
Library Acct.	36	11	2	22	10	10	26	18	6		
Payments to Branches.— Capt. Grant	98	12	6	100	5	0	103	7	6		
Travelling Expenses..	111	18	5	109	16	3	138	2	5		
£210 10 11 .. £210 1 3 .. £241 9 11											

From the foregoing statement it will be seen that on the Income Account reductions have to be noted under the heads of "arrears" and "advertisements." The receipts under the former head must be expected to decrease as the collection of subscriptions each year is made more complete. There were special reasons, which need not be particularised here, for the decrease in the receipts from advertisements. The decrease has been more than made good since the accounts were audited.

On the expenditure side the only increases to be noted have been under the heads of "Payments to Branches" (increase £31 8s. 8d.), and "Library Account" (increase £3 7s. 8d.), "Central office and administration" last year included a special sum of £10 12s. 6d. for printing, so that the reduction in that item last year was upwards of £13.

The conclusion formed from a careful analysis of last year's accounts is that there would have been a substantial balance—even after transfer of the usual £50 to the reserve—if the advertisement receipts had maintained their former level.

One other comparison may be usefully made, viz., that of liabilities and assets immediately accruing or realisable. This comparison is based on the amounts shown in the balance sheets of the past three years.

LIABILITIES.				ASSETS.				Differ- ences.*	
Sundry Creditors.				Sundry Debtors.		Cash at Bank and in hand.			
	£	s.	d.	£	s.	d.	£	s.	d.
1909-10 ..	161	11	4	218	15	10	148	8	1
1910-11 ..	199	1	11	133	7	10	196	2	11
1911-12 ..	166	2	0	266	19	11	127	15	2
							228	13	1

* Excess Assets over Liabilities.

The investments of the Society amount to £4,800 18s. 4d. The individual amounts of the three Trusts, with their purchase prices and values on September 30th last, were as set out below:—

Stock and Amount.	Cost.	Value 30 ix 12.
Berridge Trust—		
India, 3%, Consol.	£ 4,099 17 5	£ (77½) 3,177 7 1
Met., 2½%	514 10 0	(75½) 388 13 6
Consols, 2½%	186 4 11	(74) 137 16 4
	£4,800 18 4	£3,703 16 11

REGINALD DUDFIELD,

Chairman of the

Finance Committee

October 31st, 1912.

(1911-1912).

GREASE IN SEWERS.—At Acton Police Court, on October 30th, the Chiswick Soap and Polish Company were convicted of unlawfully suffering to pass into a sewer of the Chiswick District Council and into a drain connecting with such sewer a certain matter, a substance in the nature of oil or grease, by which the free flow of the sewage was interrupted, contrary to the Public Health Acts Amendment Act 1890, section 16. The defendants admitted the offence, and explained that an overflow had been occasioned by heavy rain, which had caused valuable material to be washed into the drain. Provision had been made to prevent an occurrence. A nominal fine was inflicted.

HIS MAJESTY has nominated Dr. J. C. M'Vail to be for a period of five years a member of the General Council of Medical Education and Registration of the United Kingdom for Scotland. Dr. M'Vail is a Vice-President of the Society of Medical Officers of Health, and was formerly the medical officer for Stirlingshire and Dumbartonshire, and now holds the appointment of Deputy Chairman of the Scottish Commission under the Insurance Act.

REMOVAL OF MANURE.—At a meeting of the Preston Town Council on October 31st last, a long discussion took place with reference to an order made by the Health Committee requiring the removal of horse manure once a week. In the end the order was not approved by the Council. Preston appears to be somewhat behind the times.

LAW REPORTS.

HIGH COURT OF JUSTICE.
KING'S BENCH DIVISION.

October 16th, 17th, 18th, 1912.

BEFORE ROWLATT, J., AND A COMMON JURY.
REX v. ASPANIO PUCK & CO., LTD., AND PAICE.Public Health (London) Act, 1891, Sec. 47.—
Sale of Tomatoes—Indictment—Company—
Destruction after Purchase at request of
Purchaser.

A limited liability company may be indicted for an offence in connection with unsound food, pursuant to the Public Health (London) Act, 1891, Sec. 47 (3).
A company selling unsound fruit is not, however, liable to a penalty under that section in cases where the article has not been seized, but has been purchased, and subsequently handed by the purchaser to a sanitary inspector, and has never been offered for sale as food.

The defendant company were brokers and sellers of fruit at Covent Garden Market, and the other defendant, Paice, was one of their salesmen. An information was laid against them in regard to certain unsound fruit, and they elected by their counsel to be tried by jury. The indictment was removed into the High Court by writ of *certiorari*. It charged offences under the Public Health (London) Act, 1891, section 47, sub-section 3, which provides that, where it is shown that any article liable to be seized under this section, and found in the possession of any person, was purchased by him from another person for the food of man, and when so purchased was in such a condition as to be liable to be seized and condemned under this section, the person who so sold the same shall be liable to the fine and imprisonment mentioned, unless he proves that at the time he sold the said article he did not know, and had no reason to believe, that it was in such condition.

The case was not fully tried, as the learned Judge decided that as a matter of law he must direct the jury to acquit the defendants. It appeared that one Woolward saw some boxes of tomatoes outside the defendant company's warehouse in Covent Garden Market. He spoke to the defendant Paice about them, who opened some of the boxes, and, as the tomatoes were sound, he bought 80 of the boxes for £3. On taking them home he found that a large proportion were in such a condition as to be worthless, and he asked the defendants to take them back, which they refused. He then took 67 boxes to the sanitary inspector of Poplar, who gave evidence that there were only 16 or 18 sound tomatoes in the lot. Woolward had not attempted to sell any of them.

For the defendants, evidence was given that the tomatoes were part of a cargo from Teneriffe, and the defendant company were selling them, as brokers on commission, for the Teneriffe Trading Company, and alleged that it was impossible for them to sort out the fruit and vegetables they handled, and that they were following the ordinary broker's practice in selling cheap lots on the terms that they were sold on the condition that the buyers should sort the contents and destroy the unsound, unwholesome, and unfit portion before offering to the public.

It was submitted on behalf of the defendants that a company could not be indicted under the sub-section on various grounds, one of them being that they could not be imprisoned.

It was further contended that the tomatoes had not been seized by the inspector or "found in possession" of the owner. They had been taken to the inspector. Further, they were not liable to be seized, because, in fact, they were not intended for the food of man, nor had they been exposed for sale by Woolward.

ROWLATT, J., was of opinion that an indictment would lie against a company, and that the imprisonment was not the only penalty which the section permitted.

On the second point he decided in favour of the defendants, as he was of opinion that the facts disclosed no offence under the Statute. He distinguished this from the case of *Grivell v. Malpas* [1906] 2 K.B. 32, upon which the prosecution relied.

The jury acquitted the defendants, as directed.

October 18th-22nd, 1912.

BEFORE LORD ALVERSTONE, L.C.J., CHANNELL,
AND AVORY, J.J.

SPIERS & POND, LTD., v. GREEN.

Dairies, Cowsheds, and Milkshops Orders, 1885
and 1886.—Purveyors of Milk—Registration.

A person who occasionally sells milk in connection with another business does not carry on the trade of a purveyor of milk, and therefore does not require to be registered under the provisions of the Dairies, Cowsheds, and Milkshops Order, 1885.

This was a case stated by a metropolitan police magistrate upon the hearing of a complaint made by a sanitary inspector on behalf of the Finsbury Borough Council against Messrs. Spiers & Pond, Ltd. The complaint charged them with carrying on the trade of a purveyor of milk at one of the Metropolitan Railway Stations without being registered as such in accordance with the Dairies, Cowsheds, and Milkshops Orders, 1885 and 1886.

At the hearing the following facts were proved:—
The appellants were tenants and occupiers of a refreshment buffet and bar at the Farringdon Street Station, and sold there different articles of

food and drink as well as matches, tobacco, and cigars. Amongst these articles was milk. The premises were not registered in accordance with the above Orders. The appellants were also tenants of many other premises of a similar character in London. For the purpose of obtaining milk they entered into a contract with Messrs. Faulks & Sons, of Jermyn Street, who undertook to supply it guaranteed pure and to convey it to the appellants as they might require. The milk was supplied to the Farringdon Street buffet by Messrs. Faulks & Sons by their own carts and in their own cans, which were sent for when empty and fetched away by them.

The quantity of milk supplied to the appellants at the Farringdon Street premises averaged about four quarts daily, but of these two were used for cooking purposes and one was consumed by the staff. The sale of milk by the appellants at this buffet was extremely small, amounting to about three or four glasses per week, the takings for milk being about 4d. out of £50 a week. In no circumstances was milk sold for consumption off the premises, but it was never refused when asked for, for consumption on the premises.

The appellants had registered some of these refreshment-rooms, but not others.

Art. 6 (1) of the Order of 1885 provides that "It shall not be lawful for any person to carry on in the district of any local authority the trade of cowkeeper, dairyman, or purveyor of milk unless he is registered as such therein in accordance with this article."

The magistrate convicted, holding that any person who provided milk for and supplied it to persons wishing for it was a purveyor of milk, and that carrying on the trade of a purveyor meant the providing and supplying of an article for profit.

The Court allowed the appeal, and quashed the conviction.

ALVERSTONE, L.C.J., was of opinion that the magistrate had come to a wrong conclusion as to the meaning of the expression "carrying on the trade of purveyors of milk," and had put too narrow a construction upon the words. There was nothing in the regulations to show that the mere sale of a glass of milk as an incident to the ordinary trade of a restaurant-keeper required such a person to be registered as a purveyor of milk.

CHANNELL, J., pointed out that in the Order the expression "purveyor of milk" was used in contra-distinction to "person selling milk by retail."

AVORY, J., said a person might be a purveyor of milk although that was not his sole business, but to be a purveyor of milk the selling of milk must be a substantial part of the business that was carried on by him.

RECENT PUBLIC HEALTH
LITERATURE.

Abortion in Cattle.

MELVIN (A. D.). The bacterium of contagious abortion of cattle demonstrated to occur in milk. *Veterinary Journ.*, 1912, *lxviii*, 526.

Anthrax.

EURICH (F. W.). The prevention of wool-sorters' disease (Anthrax). *Journ. Roy. Sanit. Inst.*, 1912, *xxxiii*, 507.

Beri-beri.

ANDREWS (V. L.). Infantile beri-beri. *Philippine Journ. of Sci.*, 1912, *vii*, B, 67.—
FRASER (H.). The prevention and cure of beri-beri. *Lancet*, 1912, *ii*, 1005.

Blackwater Fever.

FINK (L. G.). Blackwater fever in Burma. *Journ. Trop. Med.*, 1912, *xv*, 289.

Camps.

CRAWFORD (CAPT. M.). A method of teaching camp sanitation. *Journ. Roy. Army Med. Corps*, 1912, *xix*, 585.

Children, Care of.

LESLIE (R. M.). Child welfare and industrial insurance. *Lancet*, 1912, *ii*, 898.—
SCHAUFFLER (W. G.). The State's responsibility for its school children. *Pediatrics*, 1912, *xxiv*, 473.—
SLOAN (T. G.). The medical supervision of school children in South Manchester, Conn. *Medical Record*, N. Y., 1912, *lxxxii*, 339.

Diarrhoea.

MANNING (J. B.). Infectious diarrhoea in infancy and childhood. *Pediatrics*, 1912, *xxiv*, 553.

Dust.

OLIVER (Sir T.). An address on dust and fume.—Foes of industrial life. *Lancet*, 1912, *ii*, 865.—
WRIGHT (A. H.). Dust in the house and on the street. *Canad. Pract. & Rev.*, 1912, *xxxvii*, 576.

Eugenics.

PEARSON (K.). Eugenics and public health. *Journ. Roy. Sanit. Inst.*, 1912, *xxxiii*, 304.

Excrement Disposal.

BREWER (J. W.). Are the present methods of disposal of human excrement satisfactory? *Medical Record*, N. Y., 1912, *lxxxii*, 525.

Fever.

HORT (E. C.) and PENFOLD (W. J.). Micro-organisms and their relation to fever. *Journ. of Hygiene*, 1912, *xii*, 361.

Flies as Carriers.

LISSANT (C. G.), LEWIS (F. G.) and GLYNN (E. E.). The number and varieties of bacteria carried by the common house-fly in sanitary and insanitary city areas. *Journ. of Hygiene*, 1912, *xii*, 290.

The sections and tables dealing with malnutrition, defective vision, and defective hearing, while of great interest, reveal a considerable variation both of standard and methods of observation. In the latter examples some of the differences must surely depend on the degree of illumination of the test types and the silence of the rooms at the time of testing, they are too great to explain by random selection, and do not appear to be related to the racial or the socio-economic constitution of the respective populations.

Particular attention is given to the clinical value of observations of stature and weight, and it is urged that much would be gained if these features were noted at least annually. There are probably few indications in a child of the onset of constitutional ill-health of more importance than the failure to gain weight in the normal manner. Reference is made to reports on the results of the treatment of tonsils and adenoids, especially by the medical officers in the London area. In many cases no attention has been paid to any process of treatment other than the actual operation, which itself has sometimes been performed in an unsatisfactory manner. From one inquiry it appeared that the results were unsatisfactory in about two-thirds of the cases. This incompleteness in the method of treatment has naturally tended to prejudice the public in respect to the efficiency or value of operative procedures. Too much care and attention cannot be devoted to such cases, if the full benefit is to be reaped by the individual child. Rheumatism and heart disease receives considerable attention, as is its due; closer supervision is recommended, and due co-operation with the school attendance department is needed to prevent rheumatic children being forced to school when suffering from aches and pains which might indicate some fresh manifestation of their ailment. The importance of conveying the children with any rheumatic symptoms safely through the critical periods of adolescence to the prospect of a reasonably long and useful life is so paramount that nothing which could contribute towards this end should be neglected by the medical service or the local education authority.

A special section considers the problems arising from tuberculosis in school children and possible arrangements with existing institutions and the mechanism for treatment in process of construction under the Insurance Act. The main points set out for the consideration

of education authorities are improved arrangements for diagnosis; the provision of additional accommodation for residential treatment, particularly of surgical cases; an extension of open-air teaching and the establishment of night camps; the need for systematic and prolonged after-care and following up. The fact that infection is frequently slight in degree and that spontaneous recovery often occurs does not mean that effective treatment is not required.

In relation to following up and medical treatment the methods of several authorities receive sympathetic criticism. The school medical officer must be the keystone of the system. The school clinics now at work are described in brief, and stress is laid on the medical and educational value of adequate attention to the state of the children's teeth. The importance of the hygiene of educational methods in relation to the occurrence of defects is emphasised, and attention drawn to the report of the education section of the British Association for the Advancement of Science on the "Influence of School-books upon Eyesight." A serious amount of visual defect has been shewn to exist among children of school age, and some portion of this might be avoided by greater care in the selection of books. A standard of book production should be set up in regard to the quality of the paper, the character of the illustrations, the colour and quality of the ink used, the mode of printing, the size and character of the type, and other similar features. Common action by education authorities would soon render unprofitable the publication of books which failed to reach this standard. Action on this matter is even more important than the provision of spectacles.

The section on special schools bears witness to the increased interest in the problems of the defective child. It is pointed out that, except in the case of schools for certain clearly defined types of defect, the special school must be considered in some degree as a special school of observation, subject to frequent re-inspection with a view to re-classification and the transfer of children to the position in the educational scheme best suited to their needs. Authorities may, in fact, have to consider the establishment of definite schools of observation to which children can be admitted on probation during the period of uncertain diagnosis. This is particularly the case with children on the border lines of mental defect when it is uncertain whether they have a definite

permanent defect, or if their faculties should be regarded as being in a larval condition. Growth of experience does not, as yet, allow of a diagnosis as to the ultimate classification of every case as backward, mentally defective, or imbecile. The day special school must, therefore, continue to be regarded as a clearing house as well as a place of training. In relation to diagnosis a tribute is paid to the value of the work of Binet and his followers in various countries, especially Goddard, of Vinelands, New Jersey. The employment of psychological methods, and particularly of these graduated mental tests, is definitely recognised as part of the duties of the medical officers working under the Elementary Education (Defective and Epileptic Children) Act, 1899. The scheme for examination given in a previous report has been somewhat elaborated, and will be found in an appendix, together with some details of the Binet test. The vital urgency of continuing control and after-care is insisted on, and among the needs of the future is mentioned the power to establish and assist residential institutions of various kinds, suitably co-ordinated, some for providing custodial care for ineducable feeble-minded children, others for the training and employment of such educable feeble-minded as may require it, including power to provide for such detention as may prove necessary, with periodical re-examination.

A special feature is made of the need for increased training in "Mothercraft," both for the children in schools and through the medium of evening schools, girls' clubs, schools for mothers, babies' welcomes, and the like for those of maturer years. The teaching in such classes must be simple and homely and fall within the experience of those attending. A full account of the German system of child-welfare is appended.

Authorities are urged to pay special attention to questions of juvenile employment, and to use all means of linking up the results of medical inspection with the work of the certifying surgeons under the Factory Acts. All employed school children should receive special medical inspection since, generally speaking, in all educational areas where special enquiry has been instituted into this matter during 1911, there is evidence of the ill-effect of excessive employment on young children.

The concluding section of Sir George Newman's report deals with the provision of meals. He emphasises the point that there should be the closest possible connection between the

working of the Provision of Meals Act and the school medical service. No arrangement can be regarded as satisfactory unless the school medical officer has the right to nominate for school feeding any child found to be suffering from malnutrition due to insufficiency or unsuitability of food; is always consulted on the dietary provided; has the right and duty of inspecting the actual arrangements made in regard to the preparation, distribution and service of the meals; is consulted in all cases of doubt as to the necessity for retaining a child on the feeding list owing to its physical condition. The essence of the Act is to provide that no child shall be debarred by lack of food from taking full advantage of the education provided for it. It, therefore, follows that rigid insistence on a poverty qualification as the only test for admission to the meals is unsound, as it is obvious there may be cases in which children are, in fact, suffering from malnutrition, although the poverty test is not complied with. Any scheme which neglects the educational and refining side of the work of feeding stands in need of revision. From this point of view the undesirability of feeding children at restaurants cannot be too strongly emphasised. Efforts should be made to ascertain the effect of the meals on the well-being of the children fed. Arrangements for detailed medical inspection and the recording of the weight before and after the period of feeding would be most advantageous.

The report contains much detailed information which cannot be dealt with in a brief review, but which will require the close and earnest study of all in the school medical service who look each autumn for the summaries, suggestions and criticisms from the Chief Medical Officer of the Central Authority which serve to correlate and place in due proportion the work of each individual doctor.

RAG FLOCK ACT, 1911.—The first information under this Act was heard at Old Street Metropolitan Police Court on November 26th, when Messrs. Lehmann & Co., Ltd., were summoned. The summons was issued by the Shoreditch Borough Council, the allegation being that a sample of flock taken from bales on the defendants' premises contained 38.6 per 100,000 parts in excess of the quantity of chlorine allowed by the Local Government Board.

The magistrate said that as the case was new he would only impose a penalty of 20s. and two guineas costs. In future the penalty would be higher.

A CONSIDERATION OF THE POSSIBLE EFFECT OF CERTAIN PHYSICAL AGENCIES ON HEALTH.*

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IN these days it is a matter of extreme difficulty to find a subject connected even remotely with the health of the public which is not worn to shreds. But for some time mere passing thoughts originating in the commonest occurrences of the street and the office—day-dreams if you will—have led me, little by little, to wonder how far our advancing civilisation is having an effect on health—particularly on the health and well-being of our special organs of sight, hearing and smell, and through these on our nervous mechanism as a whole. When we talk of the public health I take it we mean not merely the public freedom from definitely ascertained organic disease but also the public freedom from disease, infirmity, indisposition, valetudinarianism or invalidism both special and general. If you will concede me this I think I can establish my plea for a fuller consideration of the effect on health of the physical agencies of heat, light, sound and smell, these being, so far as I can ascertain, the only physical agencies which at present can be shown to have any definite effect on the animal organism.

All these physical agencies—atmospheric or ethereal disturbances—share in common with all similar subtle and asomatous manifestations of physical energy two opposite qualities—that of beneficial stimulus when exhibited, so to speak, in doses attuned to the needs of the system and that of pernicious and oppressive hurtfulness when too long continued and excessive in application.

Before passing to a consideration of their effects may I be permitted to refresh your memories on the scientific theories dealing with the causation of light, sound, heat and smell. As the result of an immense amount of experimental evidence scientists have been compelled to postulate the theory that heat, light, the chemically active ultra-violet rays and the electric waves used in wireless telegraphy are the result of two sets of ethereal vibrations which together constitute electro-magnetic waves. Light is universally conceded to be the result of a form of movement of a hypothetical medium (ether) which produces chemical or electrical

changes in the contents of the visual cells (rods and cones) of the retina. On the photo-chemical theory vision is the result of the decomposition by light rays of rhodopsin and other matters in the retina, the products of decomposition giving rise to nerve-excitation and the central interpretation of such nerve impulses giving rise to varying sensations of light and colour. The precise limits of wave-length and the number of oscillations of ether per second which give rise to effects of heat, light and chemical activity have been fairly definitely ascertained by physicists and physiologists. Thus ether waves undergoing about 100 billions of oscillations per second (the infra-red rays) affect the nerves in the skin and produce heat effects: when the number of oscillations per second reaches about 400 billions (with a wave-length of about $750 \mu\mu$) the ether waves begin to stimulate visual activity and in the case of monochromatic light give rise to a sensation of redness: when these oscillations are at the rate of about 800 billions per second (with a wave-length reduced to about $380 \mu\mu$) the sensation of violet light is produced. Vibrations of shorter wave-length than the last named (the ultra-violet rays) are not productive of visual effect but still possess actinic properties and their presence can be demonstrated by chemical means. When one comes to X-rays and radium rays one reaches a vibration frequency which is literally beyond ordinary conception.

I may perhaps be permitted to remind you that sound waves differ from light and electricity waves in that sound is conducted from point to point by the agitation of the actual particles of which air is composed—one agitated particle, as it were, nudging its neighbours into motion—whereas heat, light, and electricity waves are vibrations of the ether ocean which extends (or is supposed by scientists to extend) throughout the whole universe and to be the agency by which light and heat waves are transmitted about 93 million miles from the sun.

The rate of vibration is of course much less in the case of sound waves (where it ranges for audible sounds, under normal conditions of auditory perception, from about 20 to 35,000 or 40,000 vibrations per second) than it is in the case of light or electrical waves.

I have probably said enough to indicate that when, as only very partially trained physicists, we venture on the consideration of these matters we are stepping into the arena almost unarmed. Moreover we are compelled to realize that we are after all merely playing roulette with Nature's

forces for out of the sheer necessities of life we are exposed to one and all of these forces day in and day out and yet, as I hope to show you before I have concluded my address, we have, so far, taken but little thought as to their potentiality for mischief nor have we in most cases considered the best means of averting injurious consequences. If my address to you stimulates further research in connection with these questions it will not have been written in vain.

I propose to consider these various physical agencies in turn and to present you with such evidences of their effect on the health of the public as a busy life has enabled me to collect from numerous sources.

Taking the physical agency of heat first, it must be realised that in considering the effects of heat one is confronted with the difficulty of separating them from their common concomitants, *i.e.* nervous exhaustion, impure air and alcoholic excess. Commencing with the general aspects of the case it is acknowledged that, leaving out parasitic diseases the *causæ causantes* of which require a comparatively high temperature for their development, there are very few diseases which appear to be caused by high temperature alone. Hepatitis and congestion of the liver are specially prone to occur in hot climates, but there is a distinct doubt as to whether dietary, and especially alcoholic, excess is not mainly responsible for such diseases. There is a dearth of reliable information on this point and one is driven to the occupational diseases for what little evidence is available. In considering such occupational diseases there are two fairly distinct classifications to be made. In the one group, best exemplified in the case of blast furnacemen, puddlers, steel moulders, sheet and plate-glass rollers, lead smelters, the enamellers of iron plates and hollow ware, etc., etc., there is an *intermittent* exposure to high temperatures. In the other group, of which one has instances in miners, laundry workers, cotton weavers, flax and jute spinners, etc., one has a more or less *continuous* exposure.

In the case of the first group, those exposed to intermittent high temperatures, one finds but little more than a record of lumbago and similar diseases arising from improper precautions against chill after leaving work. In the latter group, that of workers exposed to a fairly continuous though lesser degree of heat, there is little to record except the occurrence of headache and vertigo. But Oliver (*Diseases of Occupation*) states from personal observation

that in the case of the miners of Sopron-Brennberg, where the temperature of the mines is almost invariably high, the miners are prematurely old in appearance, are practically all thin and of spare build and that a large number suffer from functional or organic heart disease. "The effects of working in high temperature mines" he says, "are throbbing of the head, increased frequency of the pulse, discomfort in breathing and physical exhaustion."

This part of the subject requires much further elucidation. Now that underground railway "tubes" are being installed for ease in transit, the general public run *some* risk at all events from their use. The air temperature in such tubes is approximately 5° F. higher in summer and about 15° F. higher in winter than that of the streets, and chill is apt to be felt when re-entering the streets from the tube or when sudden cold draughts take place through the tubes as they do quite frequently.

In considering the effects of heat as exemplified by various climates, we have to distinguish between the effects of the presence or absence of sunlight and those of heat and cold. The researches of Pflüger and Parkes show fairly equal and opposite effects of the two agencies—heat and cold. Heat, if beyond what the organism is accustomed to, lessens the functions of digestion and respiration; the nervous system is depressed; the action of the skin is increased and that of the kidneys diminished; and, owing to the relatively smaller volume of oxygen present in the air breathed, there is a general impairment of nutrition induced. Parkes considers that the effect of the direct rays of the sun is to decrease perspiration and thus disturb the heat-regulating mechanism of the body. Cold within reasonable excess of customary ranges increases carbonic acid exhalation and appetite and improves generally digestion, circulation and metabolism.

The effect of sunless days, as has been pointed out by Sir Hermann Weber and others, is to lead to depression, disinclination for work and even dyspepsia. Those accustomed to the stimulation of sunny climates have often been observed to become the subjects of a melancholic depression when compelled to pass even a short time in London during the dog days despite the numerous meretricious attractions of that City, which symptoms almost always vanish under the benign rays of even an October sun. This has been observed particularly in Swiss and Italian organ-grinders who have come to England to try their fortunes.

*Read at a Meeting of the North-Western Branch of the Society on October 18th, 1912.

Physiological observations on the batrachia, support these otherwise rather fanciful deductions: frogs exhibit an increased absorption of oxygen and an increased excretion of carbonic acid under the influence of light and there is a general agreement that oxidation of animal cells is increased by light. According to Sir Hermann Weber—"the effects of light on the animal organism are due to its action on the centrifugal nerves and especially those of the retina; but the researches of Quincke and other observers show that light also acts directly on the cells and tissues without the influence of nerve centres."

Dr. Bowles' researches on the effects of sunlight on the human system in the Alps led him to the conclusion that the sunburn which resulted was due not to the heat-rays but to the rays at the violet end of the spectrum and that the rays reflected from the snow were more potent than those coming direct from the sun or those reflected from the rocks (Clifford Allbutt's *System of Medicine*). Ordinary sunlight is not rich in these rays, for they are largely absorbed by the atmosphere.

Contrast the effects of these two agents, light and heat (for they cannot be well separated in this particular connection) on the temperaments and vital energies of the Sikhs of Central India and Bedouins of Arabia, whose impulsive martial energy is constantly exemplified in history, with the balance in mental and physical development of the inhabitants of the temperate climates of Western Europe, and bring into your thoughts also the association of these agencies with the neurotic activity and impulsive dash of the inhabitants of North America with its dry, rapidly changeable climate—a climate which induces habits bringing in their train neurasthenia multiplied by neurasthenia.

Speaking quite generally there appears to be a kind of general constitutional erethism produced by certain climates where rarified air accompanied by ample sunlight is constant and the effect of this is so marked in the production of light sleep, quick pulse, rapid digestion and so forth (in general terms of accelerated metabolism) that physicians in charge of patients who run a risk of burning themselves out too quickly have to exercise the greatest circumspection before they venture to prescribe such climates. This all goes to demonstrate that the effects of the merely physical agencies of the atmosphere are matters to be taken into serious consideration.

The extent to which Nature can play tricks with us may be further illustrated by the occurrence of cases of subjective colour vision.

For example, one has erythropsia or red vision occurring not merely under distinctly abnormal conditions, as after the removal of the lens for cataract, but also coming on after strong stimulation—for instance, after exposure to the light reflected from snow. Physiologists have as yet furnished no satisfactory explanation of this: In a similar class we have night-blindness or nyctalopia occurring after exposure to too strong a light, especially in cases of lowered nutrition (Schäfer). These and various other peculiarities of vision—disordered colour-vision, coloured audition, and the fact that the actual limits of the visible spectrum vary considerably even in persons of normal sight show us clearly that there is no direct and unvarying connection between physical stimulation and physiological reaction. This is acknowledged by physiologists who have at various times attempted to establish a definite relation between the degree of stimulation and the extent of reaction but who have been baulked by the fact that though physical stimuli are capable of exact measurement, physiological sensations or reactions are dependent on a number of varying factors. In other words, varying organisms possess varying reactivity to physical stimuli. The net practical result is surely that in estimating the possibility of injury from over stimulation idiosyncrasy is the chief item for consideration.

When one comes to consider the effect of light on diseased conditions, that is to study the particular branch of therapeutics which has already been dignified by the name *Helio-therapy* or *Photo-therapy*, one finds quite a wide field of usefulness. Let me just quote you a few instances of this in order to demonstrate the potency of light as a physical agency. Widner has described several cases of chronic ulceration of the legs in which exposure to ordinary direct sunlight for two or three hours daily for about a week has resulted in cure and also speaks of other skin conditions similarly benefited. (*Munch. Med. Wochenschrift*, March 26th, 1907). Mestcherski mentions several cases of chronic intractable eczema cured by exposure to direct sunlight for about 20 minutes daily for a short period. The same clinician claims electric light baths as being amongst the best methods of treating chronic psoriasis. Bruel is of opinion that blue light is of considerable advantage in the cure of chorea. The Finsen light treatment of lupus is familiar to you all I have no

doubt. The ultra-violet rays of the mercury vapour lamp can set up an active dermatitis in a few seconds. Sun and air baths as well as artificial radiant heat baths are found to be of considerable utility in cases of arthritis. Helio-therapy is also lauded by Continental physicians for the treatment of surgical tuberculosis and tuberculous peritonitis and, more recently, for laryngeal tuberculosis. For the latter a rather ingenious arrangement of mirrors enables the sunlight to be reflected into the interior of the larynx. The beneficial results obtained are said to be remarkable. (*Lancet*, April 6th and 27th, 1912, and *Progrès Médical*, September 21st, 1912).

Generalising on these various methods of treatment and putting aside lupus as a case where the purely germicidal effects of concentrated high-power rays are probably chiefly concerned, one may assume that the beneficial effects are due to the induction of an artificial local hyperæmia in the hope (which is undoubtedly very often fulfilled) that the reaction will be a healthy one. But the whole of the observations and experiences cited bear out what I am endeavouring to accentuate, namely, that there are properties in sunlight and other ethereal vibrations which, quite apart from their extraordinary applications, have a direct and potent effect on health and well-being. Like every other physical agency their application to the human organism is beneficial when applied in physiological moderation, but when excessive having regard to the standard of evolution to which we have attained (or it may be to individual idiosyncrasy) the effects may be more or less hurtful.

I may be pardoned for also alluding in this connection to John of Gaddesden's views on the supposed action of red light on the skin in cases of smallpox: these have, I imagine, been discredited by most subsequent observations; and one may also allude to the German practice of encouraging sun-baths in their sanatoria for consumptives.

With the advancement of modern science we have been brought under very trying conditions in the matter of artificial light, and it is distinctly questionable whether our eyes have been educated up to such a point that they can face most of these new lights unless very careful shading and screening be adopted.

The manufacturers of modern electric lighting accessories have fully realised the physical fact that their greatest success will be attained when they have got the fullest possible amount

of the energy of the current available concentrated at work in the visible part of the spectrum. By way of explanation one may say that the energy in the visible part of the spectrum of a gas flame is practically *nil*, and, despite the fact that the temperature of the arc lamp is the highest obtainable only comparatively little of the energy is manifested in the visible part of its spectrum. The old carbon filament lamps could only be raised to a temperature very much below that of the present metallic filament lamps, but the latter again fall considerably below the temperature attainable in the arc lamp. Manufacturers of electric light lamps are now endeavouring by the utilisation of materials which will stand a very high temperature and in other ways to secure that the available energy shall be concentrated as much as possible in the visible part of the spectrum, so as to obtain as brilliant a light as the current employed can possibly yield. Developments towards the maximum are undoubtedly taking place very rapidly; let us hope that they will not come upon us before evolution has properly adapted us to their reception. The metallic filament lamps which have come so rapidly into vogue,—tantalum, tungsten, helion or carbon-silicon and osmium,—are no doubt excellent from the point of view of lighting and current consumption, but we know virtually nothing of the possible effects of the light rays from such lamps when unwisely or improperly used. The fairy greenness of the Bastian or Cooper-Hewitt lamp, which shines by the incandescence of mercury vapour, and the golden rays of the "flaming arc" lamp are indeed things of beauty but, again, there may be dangers attending their use at close quarters of which we are not aware.

Consider in this connection the effect of concentrated sunlight on the eye; in the case of one famous astronomer the effect of the cracking of a smoked glass through which he was observing an eclipse resulted in paralysis of the optic nerve. Consider also, as an instance of the same thing, one which may be well-known to some of you, the effect on the eyes of electric welding where the light produced is so intense that the naked eye cannot bear to look on it even for an instant and yet the workers protected to some extent by smoked or blue glasses have to concentrate their view continuously first on one point and then on another so as to direct the current to the proper spot. The intensity of the light has

been estimated at 8,000 candle-power and the heat may rise to 7,000 °F. (Thorpe, *Diseases of Occupation*, p. 354). The effects are seen not merely in the conjunctiva and cornea (Snell), but also in the optic disc and retina (Thorpe). That similar, though of course less, injurious effects may arise from the use of domestic electric light is only to be anticipated, particularly in these days when there seems to be a craze for 100 and 50 candle-power lamps, several of which may be united in series so as to produce 200 or 300 candle-power in one small room, is only to be expected. "Electrical ophthalmia" or some close equivalent will shortly be scheduled not merely as an occupational disease but as one which may, unless due regard be paid to the effects of glare, have to be reckoned on as one of the ordinary penalties of civilisation.

I may also tell you this as a concrete illustration of possibilities in this connection that out of about four electrical engineers connected with municipal electric lighting schemes whom I know personally, two are suffering from a kind of fibrillary tremor of the palpebral muscles, coupled with obvious photophobia, which may terminate in nystagmus. Glass-blowers' cataract seems to come into much the same category of diseases as those to which I have alluded, and exposure to strong electric light has been noted as causing erythema of the skin.

Those of us who are using electric light habitually know by experience, I fancy, that the effects of its glare are apt to be most irritating. Why is this? Is it because we have to concentrate our vision on a part which is adequately illuminated and divert it from a part which is inadequately or too brilliantly illuminated, and that the effort becomes exhausting after a short while? Or is it a mere tiring effect due to the impaction of energy on a part of the retina which, having no work to do, wants to remain quiescent for the time being? Or is it a more direct effect on the retina or optic disc due to over-stimulation or irritation caused by the high-power rays of this light? I am inclined somewhat strongly to the last-named view, for I imagine that education and adaptation of the eye would at this stage of our evolution render the first two factors of comparative unimportance. Whichever it be, I think our warning should go out to all who use electric light, whether in the factory or the workshop, the office or the home, that the greatest care should be taken to secure the

concentration of an ample but not super-abundant light (because of undue reflection) on the work which is being illuminated without glare, leakages or undue diffusion, which may result in retinal strain. Even Mr. Samuel Pepys, writing in 1667 (February 16th), makes the following sage statement:—"My eyes mighty bad with the light of the candles last night, which was so great as to make my eyes sore all this day, and do teach me, by a manifest experiment, that it is only too much light that do make my eyes sore."

The speeding-up of machinery in factories is closely connected with this part of my subject, for it undoubtedly throws a serious strain first of all on the eye, which has to follow at an abnormal rate such things as broken threads, and this subsequently has its effect on the nervous and circulatory systems in particular, inducing premature old age in those who are compelled to adhere to the occupation.

When we turn from ordinary sunlight and ordinary artificial light to what we may for the time designate as specially-induced light, that is to say light rich in varying degrees in ultra-violet rays, such as X-rays, radium rays, Finsen light and the like, we arrive in a country where the very language is for a time quite foreign to many of us and where the least wrong step may lead to the most serious disaster.

We can up to a certain point play, as it were, with the most potent forces of Nature and harness them to our pleasure and to our needs. By their careful regulation we can produce effects of great convenience and of undoubted therapeutic utility without risking any pathological after-effects. But if we overstep the narrow dividing line of safety—and this is often but a mere filament—we are at once in a country where danger lurks unseen on every hand. To emphasise this I may quote a few instances from authors of repute in this connection. "Radium rays cause slow degenerative changes in the cellular elements of the skin, and to a slighter extent in those of the glands, blood-vessels and muscles." The after-results or unanticipated sequelæ of X-ray treatment are not merely superficial or cutaneous, but are occasionally deeper—affecting the nerves and causing disorders of sensation—whilst general constitutional reactions such as high fever, fatigue, vomiting, faintness, etc., are by no means rare. The occurrence of azoospermia, sterility, dermatitis and cancer in X-ray workers furnish us with extreme examples of the capacity for mischief of what I have termed specially

induced light rays. That the physiological effects of radium emanations are potent to a degree that was at one time deemed incredible is now quite well known to us. I may recall to your memories the effect of such rays on Prof. Curie, who once submitted to having a sealed glass tube containing the merest pinch of one of the radium salts tied to his sleeve for 1½ hours. The result was an intense inflammation followed by a suppurating sore which did not heal for more than three months. Paralysis in mice and caterpillars has been caused by slight exposure to radium rays. When one recollects that the Gamma rays from radium (which are supposed to be the rays chiefly concerned in the physiological action of radium rays) will pass readily through a foot of solid iron and several inches of lead and that they can induce radio-activity in air, water, clothing, and even the very persons of the workers—indeed in almost, if not quite, everything in air, earth and water—one acquires a respect for them which is very real indeed.

A similar thought results from the consideration of the potentialities of ultra-violet rays. You are all acquainted with their destructive effects on the lower forms of life as evidenced by the fact that they are now fairly extensively used on the Continent for the sterilization of water. There is an abundant supply of ultra-violet rays in the light furnished by an arc-lamp. These ultra-violet rays can cause a migration of corpuscles or negatively charged particles (ions) from metals, and corpuscles are also given off from gas-flames and incandescent carbon, burning magnesium wire, etc. And these corpuscles travel with an almost inconceivable velocity—the corpuscle which does not travel a thousand times more swiftly than the swiftest rifle bullet is a mere laggard. Cathode rays produced in vacuum tubes are merely beams of corpuscles and they again, when produced in bulbs under extremely low pressure, produce X-rays by impaction on glass or on metal plates. The facts that these corpuscles are negatively electrified particles capable of imparting heat, phosphorescence, mechanical motion and so forth to other bodies and with the power under certain conditions of inducing the birth of X-rays show us that we are in the presence of physical agencies of tremendous potency which may be, and almost assuredly are, capable of influencing physiological action and probably also of producing pathological deterioration to an extent which may not be cleared up for the next half century.

By way of emphasizing these effects of undue stimuli I may allude to certain other cognate results of over-stimulation caused by physical agencies. After exposure to an electrical shock it is, one is informed, quite common for "nervousness," with headaches and ill-defined pains in various parts of the body, to ensue for some time afterwards, and the peculiar thing is that such conditions appear to be aggravated by disturbed electrical conditions of the atmosphere. This is akin to the feeling which a good many people have when the atmosphere is in a state of electrical tension as it is prior to a thunderstorm. As is commonly known many persons feel depressed and "headachey" and suffer from various forms of *malaise* at such a time, and these disagreeable feelings disappear when the electrical tension is removed or, as they put it, when the air is cleared as a consequence of the storm.

Possibly further removed still from the precise point under discussion, but nevertheless remotely connected with it, is the fact that there seems to be a magnetic affection of the atmosphere as well as a temperature effect produced by the condition of the sun itself. There is said to be a distinct periodic change connected with the appearance of sun-spots and other solar disturbances recurring about once every eleven years, and this is stated to have an effect on such things as fruit harvests and vintages as well as things more remote from the animal and vegetable kingdom, such as rainfall and storms. Whether any connection between such magnetic and temperature disturbance and general or special mortality, the prevalence of infectious disease or the general health can be traced is one in which those fond of the refinements of statistical research may find an interesting field of study.

We have considered the effects of excess or improper application of light and the evidence supporting this. When we come to the converse it is at once apparent that we require much more reliable evidence of the effects of *want of light*. We know in quite a general way that, just as in chlorophyll-containing plants deprived of light there is a condition of "etiolation" produced in which the plants literally grow to death, so there is a depressing effect, the extent and precise nature of which we understand but little, produced in the human economy in the absence of sunlight to the *My old teacher* and surgery, Prof. Johnnewhat surred to s- at the rickets was largel-ffluvia on the h- an- organism courts and alley- en more closely studied by

sermons used to find a parallel in the green and blanched portions of the celery plant. Surely the experiences of arctic and antarctic explorers and residents should be able to produce some evidence on this point. And are there no statistics available or procurable of the state of nutrition, particularly of the blood (with blood counts and hæmoglobin estimation) in coal miners, dwellers in dark courts, night-workers and the like?

The effects of ordinary daylight upon tubercle bacilli, to say nothing of the experiments of Downes, Tyndall, Duclaux, Arloing, Ransome and others, on the germicidal properties of sunlight are surely sufficient to justify further experiments and investigations on the human system.

There is another matter which seems to follow on the considerations I have just put before you. We are accustomed to hearing people describe certain colours, such as red, brown, chocolate, orange, crimson, etc., as warm, and certain others, such as yellow, blue and green as cold, and, though we may put this down as mere sentiment or ultra-æstheticism, I am not so sure that there is not a true feeling of warmth produced by surrounding ourselves with the proper colours. The material, of course, to which the colour is attached has to be considered, but I am sure that, taking the simple case of distemper on a plaster wall, most people would find a more comforting feeling of warmth induced in them by a wall coloured red than by one coloured blue. And this is closely connected with the comparative powers of absorption and radiation possessed by these different colours and is not merely a passing popular fancy. Experiments with a large number of surfaces have shown that the lighter in colour and the more polished the surface the smaller is the power of absorption and radiation. For the general rule is that the best absorbers are the best radiators and *vice versa*. There are many mistakes made in this connection in regard to institutional and even private buildings. A radiator for heating a room should always have a dull dark surface if it is to be really effective. Polished metal surfaces are well known to be aboth cold in appearance and cold to the touch; they are also bad absorbers and bad radiators of heat.

I think on the question of sound I could find many useles to say, by whether ironfine myself to the workshop, office or the more of a public. greatest care should be taken to not propose to

comment at length on the distracting influence on a business man of the street organ or the "German" band. These we should all consign to Hades if we had a say in the matter, and fortunately the bye-laws of a few ultra-enlightened communities enable one to consign them not thither it is true, but to an aphonic distance; for which, as Mr. Samuel Pepys would say, "The Lord God be praised." What I would speak of, however, is the oft-times unsupportable noise to which as business men we are quite unnecessarily subjected. Nowhere better than in Manchester can one appreciate this. The rumble of the dray, the racket and clang of the tram-car, the raucous and ever-varying blasts of the motor-car, the strident voice of the news vendor, the tuneless jangle of the street-organ all combine to produce a cacophonic pandemonium which a Dante alone could adequately describe. Had not evolution and adaptation to environment been hard at work, and working overtime at that, we should have been delirious or mentally supine by now. But has all this constant striving against environment been good for us all? I include particularly those who have to concentrate attention or run the risk of losing thousands. The emphatic answer is "No"—what we gain in one way we lose an hundredfold in another.

Can good mental work be produced in the midst of this clangorous Inferno? Think, by way of contrast, of Robert Louis Stevenson in the almost magic stillness of Samoa, of Wordsworth in his secluded rural hamlet, of Ruskin undisturbed except for the peaceful lapping of Ullswater, of Robbie Burns in the rugged tranquility of his simple home, of Dante in the mediæval quiet of Florence, of Milton in his blind retirement, of Scott in his stern but peaceful Caledonia, of Tolstoi in his crude estate far from the din of Moscow, of Carlyle in the then muffled precincts of Chelsea—one could multiply such instances almost indefinitely. Imagine any one of these transplanted to the din of Central Manchester, and ask yourselves what would then have been the quality of his work. Mental work of any kind, if it is to be outstandingly good, demands absolute freedom from distraction and interruption, and particularly from distraction by sudden adventitious sound. The elimination of adventitious sounds from the several impressions which are striving to produce an effect on our mentality induces a strain, the effect of which is to cause a much greater waste of energy than need be called for. Distraction of

any kind, unless one yields to it as a leaf to the wind, must demand an output of energy disproportionate to the real necessity. And our energy output is by no means limitless, nor can it be exceeded, even spasmodically, without some detriment to the vital source of energy, or, in other words, without some more or less permanent strain or damage to the controlling nervous system. You may think I am talking of trifles. If I may attempt an epigram, I would say that "the sum of trifles is infinity." Trifles to the n^{th} power equal the alpha and omega of entity.

Let us pass, finally, to the consideration of the direct effect of extraordinary sound on the nervous mechanism of the ear. And here, once more, we come back to the consideration of what is physiologically bearable and of the range within which we can permit of variation without the likelihood of detriment resulting. Evidence is only available on a few aspects of this question.

Super-excitation is well recognised to be productive of harm to all sense organs, as well as to all bodily processes dependent on nerve stimulation. Mal-excitation, it may be assumed, produces identical effects. And by mal-excitation I mean the modern obtrusion on our hearing mechanism (with transmission to numerous other centres in our system) of sounds for which that mechanism is not and cannot well be attuned or prepared. The result is not merely a strain and a jar on the hearing mechanism, but it means that the brakes have to be jammed hard down on some other peacefully progressing part of our nerve machine.

A normal ear which is accustomed to receiving, say, from 50 to 35,000 vibrations per second, fairly equally distributed in frequency during the 24 hours, if constantly compelled to receive vibrations of a high or low rate of frequency will become tone-deaf to other vibrations. And if constantly strained by having to receive too powerful vibrations certain conditions, such as thickening of the membrana tympani, inflammation and even ankylosis of the auditory ossicles, degeneration of the organ of Corti, and so forth, may ensue, and hearing become impaired or lost. Such happens, for example, in the case of boiler-makers, who almost invariably become deaf after some years spent in this occupation.

A defective capacity for hearing notes of a high pitch (partial tone-deafness) is one of the common signs of deafness in boiler-makers and

those who have worked for some time in noisy surroundings. The generic term "boiler-makers' deafness" is used to denote similar conditions occurring in coopers, riveters, tin-smiths, locksmiths, carpenters, factory-workers, engine-drivers and firemen, etc. Deafness is common in jute-workers, owing to the excessive noise of the weaving looms and spinning-frames, aggravated by the formation of wax plugs in the external meatus, the latter being associated with the presence of dust in the atmosphere. Artillery-men and sailors on men-of-war and many sportsmen suffer from a similar type of nerve deafness. Tinnitus is frequently complained of, but the most usual symptom is gradually increasing deafness. The deafness is usually of the labyrinthine type with lowering of the upper limit and retained hearing of low notes. Histological examinations made by Habermann and Bruns have shown atrophy of the organ of Corti, atrophy of the spiral ganglion, etc. (Allbutt and Rolleston's *System of Medicine*, Vol. IV., Part II.). Sir Thomas Oliver's theory of the deafness of boiler-makers and other exposed to low and recurrent sound is that there is considerable shock to the liquid in the labyrinth of the ear, and there is thus induced a brusque displacement of the terminal endings of the auditory nerve; these are either paralysed or become the seat of some abnormal irritation, which is subsequently followed by loss of function." "The sudden report of a piece of artillery, or even the shriek of a railway engine, may cause serious deafness from injury to the terminal structures of the auditory nerve" (Barr). Dr. Barr suggested eleven years ago, in his book on "*Diseases of the Ear*," the adoption of low-pitched whistles for railway engines, and special attention by drivers, so as to avoid sudden loud and high-pitched notes such as are caused by whistles and the screeching and hissing of steam escaping through a narrow opening, especially when standing in covered railways stations, and many members of the public would be grateful if his suggestions could be adopted. I am glad to see that the Local Government Board have now issued an order prohibiting the use of a "cut-out," or direct exhaust in the case of motor cycles.

Passing now to the last phase of this large subject, I should like to direct your attention for a few minutes to the effects of *smells and effluvia*. It is somewhat surprising that the effects of various effluvia on the human organism have not been more closely studied by

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physiologists and even by sanitarians than they have been. One feels convinced that there is much to be learned in this connection. Certainly we know a little of the effects of the more pungent smells such as ammonia, sulphuretted hydrogen, sulphur dioxide, chlorine, phosphorus and phosphoretted hydrogen, carbon bisulphide, acetylene, nickel-carbonyl, ferri-carbonyl, coal-gas, cyanogen, aniline, exhaust petrol vapours, benzene and naphtha vapours, spirit paints, and the like; but here we are dealing with the direct noxious effects on mucous membrane, on the nervous system, and on the chemical constituents of the blood of well-known chemical compounds, and we are merely dealing with physiological or pathological chemistry and with fairly ascertained chemico-physiological interactions. What of the effects on health of the odours or malodours of, for example, decomposing sewage, drain-gas, privy-midden contents, horse-manure, the odours of gut-scraping, bone-boiling, knackers' yards, glue and size-making, and of other scheduled offensive trades? What, too, of the odours of the fish-frying shop, of badly scavenged streets, of new paint and varnish, of dry rot in a dwelling, of the odours diffused on to the pavements of our towns from underground restaurants?

Dare anyone assert that, in complaining of the possibility or probability of ill-effects of these odours, we are standing on adequate scientific grounds? I think not. We hear of people who have been more or less violently sick, or who have suffered from gastro-intestinal disturbance after exposure to such odours; but our knowledge of the matter is purely empirical, and not only that, but is liable to be vitiated by the presence of temperament or diathesis. The odours of the farmyard or dung-heap may be as nothing to a farm-labourer, but exposure to the smell of a stagnant sewer may make him violently ill. It is quite a common occurrence for a youth to be so affected by the smell of "mill-oil" when he first begins to work in a factory as to cause him to have to leave work for a day or two; but after a while he becomes so accustomed to it that he can eat his meals with enjoyment in an atmosphere which would nauseate most people. Since penning this experience, which came under my notice about twenty years ago when acting as medical officer of health to the Brighouse Corporation, I have learned that both in linen and jute mills there is a condition well recognised locally, known as "mill-fever," caused by the

disagreeable odour given off by the oil used and by the stifling and moist atmosphere of the workrooms. This condition lasts for two or three days, and is accompanied by nausea, vomiting, headache, and a rise of temperature.

The whole subject of the effect of odours on the human system is one which still remains to be worked out by the physiologist. It is a most promising field, as anyone who thinks for a few minutes can realise. Smell is akin to taste, for what is one man's pleasure is another man's abhorrence. Take the case of perfumes, for instance—what one person rejoices in is utterly distasteful, possibly almost nauseous, to another. Some people revel in the scent of Cherry-blossom, whilst to others it is highly objectionable and oppressive. Some people sniff in with eagerness the ammoniacal smell of a stable, and say they derive benefit from it; others shun it like poison. Some people drink in the odours of cow-dung with distinct satisfaction, or so they say; others, and I imagine the majority, are repelled by them. Wherein does this different effect of the same combination of gases or effluvia consist? Why is it, to take extreme examples, that most of us are repulsed by the odours of a third-rate fried-fish shop, and attracted by the fragrant smell of Ylang-Ylang? Is there a wave-length of ethereal vibration in the case of smell? Is there a possibility of super-excitation occurring or of a complex and diffuse excitation taking place of the olfactory nerve, which involves other nerve centres, and thus produces nausea and vomiting? Individuals are differently constituted in the excitability of their olfactory centres, as we all know, and there is probably also a smell-"blindness" akin to colour-blindness, and an olfactoro-phobia akin to photophobia. I strongly suspect that all of these really do exist, and could be proved to exist if proper research methods were applied to them. If they were adequately demonstrated, would it not make it easier for us as medical officers of health, in speaking of an effluvium nuisance, for instance, to be able, as it were, to classify it, and assess its toxic properties in scientific terms?

Chemistry has come to our aid so far as it can in the case of practically all the natural perfumes, by analysing their constituents and synthesising successfully the majority of these elegant substances. For instance, we may now have artificial oil of bitter almonds (benzaldehyde); this, when free from chlorine, which rendered the first synthetic product

unusable in perfumery, is indistinguishable by all except the most highly-trained expert from the natural product. We have also artificial oil or winter-green (methyl-salicylate), artificial coumarin (the groundwork of the perfume known as "new-mown hay"), artificial vanilla, artificial oil of mirbane (mono-nitro-benzene and mono-nitro-toluene), and numbers of other synthetic products to imitate the scents of lilac, hawthorn, violets, carnations, rose, jasmine, acacia, hyacinth, etc. The chemist has thus cleared this particular field for investigation by the physiologist, and if a similar undertaking were carried out in the field of unpleasant odours the way might be opened up for the prevention of many of their undesirable effects on the public generally, and particularly on that section of the population which has to work in an atmosphere charged with them. To give a possible instance, it might be found that, just as in the synthesis of artificial oil of bitter almonds, the rendering of the benzaldehyde free from chlorine yielded a product free from objectionable odour, and therefore usable in perfumery, so the chemist may be able to tell us how fish-frying can be carried on without the diffusion of nauseous and permeating odours, how sewage can be rendered inodorous, and so forth. All these malodours, like natural sweet perfumes, are composed of definite chemical constituents and, like natural perfumes, can be analysed and synthesised so as to show us exactly wherein their specific objectionable properties lie, and how the development of these objectionable properties can be prevented.

Before deciding to conclude this subject I had some thoughts of bringing to your attention the question of the effect on health of purely mechanical vibration, such as one experiences in certain movements of massage and in the so-called vibro-massage, as well as in the jolting and jarring and the sometimes pleasurable vibration felt during a journey by carriage, train and tram, on switchback-railways and the like. My subject has, however, proved all too difficult to deal with as I set it out at the beginning, and I can only therefore recommend to some of my juniors a consideration of the possibilities I have only hinted at.

May I conclude with a few quotations from Emerson—all of them pregnant with instructions to those who grasp their inward meaning in connection with the subject which I have just been discussing:

"Nature trips us up when we strut."

"Nature suffers nothing to remain in her kingdom which cannot help itself."

"Nature is despotic and will not be fooled or abated one jot of her authority by the pertest of her sons."

"Nature never hurries: atom by atom, little by little, she achieves her work."

SPREADING DISEASE.

A DISCUSSION recently took place at the St. Asaph (Denbigh) Rural District Council, on a recommendation of the medical officer of health, to prosecute a farmer for failing to notify an outbreak of scarlet fever in the hills of Denbighshire. Members urged that the man acted in ignorance, not knowing what the disease was, but the sanitary inspector said that on his approach the children ran to the mountains, thinking he would take them to the hospital. They were peeling at the time. The farmer afterwards did all that was required to isolate and disinfect.

It was stated that cases were known where parents said that if the child died they would know it was scarlet fever, but if it got well it was not that disease.

The Council decided that on the evidence they could not prosecute, but decided to issue warning notices.

APPOINTMENTS.

DR. H. T. EVANS has been appointed medical officer by the Bedwelty U.D.C.

DR. ROBERT J. EWART has been appointed medical officer of health to the Barking U.D.C.

DR. WILLIAM JAMES HOWARTH has been appointed medical officer of health for the City of London.

DR. E. A. HUTTON-ATTENBOROUGH has been appointed medical officer of health for Stamford.

DR. H. HOLROYD has been appointed medical officer to the Herefordshire Education Committee.

DR. HAROLD KERR has been appointed medical officer of health for the City of Newcastle.

DR. F. S. LINTON has been appointed medical officer of health for Scarborough.

DR. H. S. MASON has been appointed medical officer of Health of Pontypool.

DR. O. H. J. N. MURISER has been appointed chief tuberculosis officer for the County of Northampton.

DR. B. OSMOND-BARNARD, of Machen, has been appointed medical officer of health for the newly-formed Urban District of Bedwas and Machen.

DR. C. J. PICKUP has been appointed medical officer of health for the Wombwell District.

DR. THOMAS RHIND has been appointed by the combined districts of Thornbury and Chipping Sodbury as medical officer of health and inspector of school children.

DR. H. H. THOMSON, of Newport, Mon., has been appointed tuberculosis officer for the County of Herts.

ADMINISTRATION OF SANATORIUM BENEFIT UNDER THE INSURANCE ACT, AND THE POSITION OF THE VARIOUS OFFICERS IN CONNECTION THEREWITH.*

By J. J. BUCHAN, M.D., Medical Officer of Health, St. Helens.

EVEN amongst those who have given the most careful attention to the subject, it is difficult to avoid confusion of thought in considering sanatorium benefit. The benefit itself is defined in Section 8 (1) (b) of the National Insurance Act, 1911, as treatment in sanatoria or other institutions or otherwise when suffering from tuberculosis or such other diseases as the Local Government Board with the approval of the Treasury may appoint. Although some doubt may exist as to how far the words "in sanatoria" may qualify the words "in other institutions or otherwise," the definition is probably wide enough to cover every variety of treatment at present adopted, or in future to be devised for tuberculosis. The treatment to be given requires the approval of the Local Government Board, under Section 16 (1) of the Act, but the term is used in its widest sense, and includes institutional and domiciliary, hygienic and prophylactic, and therapeutic and dietetic treatment, and other approved measures. The definition of sanatorium benefit, as a benefit to an insured person, implies some advantage to be given to him, or it may be to his dependants, in partial consideration of the payments he is required to make under the Act. It has, however, been very properly appreciated that, in order to obtain the most beneficial results from the work proposed to be done amongst the insured, the same measures should be made available to the whole community. This has been rendered possible by the operation of Section 16 (3) of the Act, which prevents the benefit being claimed as a right, and makes it only to be given on the recommendation of the insurance committee. The considerations which should guide an insurance committee in recommending sanatorium benefit are, therefore, the same as those which govern the providing of treatment for the tuberculous by the local authority. The distinction of sanatorium benefit, as a benefit for insured persons, virtually disappears, and our discussion of to-day on the administration of sanatorium benefit resolves itself into one on

the administration of the treatment of tuberculosis for the whole community. It has rightly been insisted upon by Dr. Leslie Mackenzie, among others, that any treatment of the individual will only attain its best results when given in proper relationship to the whole social conditions of the sufferer, for in such a disease as tuberculosis many factors arise which must be regarded in prescribing the best course to be adopted. The sufferer and his conditions are not alone to be considered; the cause of his illness and his facilities for spreading the disease require, among many other things, to be specially borne in mind. It is clear that the various medical questions which arise are to be grouped under at least two main divisions, the clinical and the hygienic, and though on many points the distinction between these divisions is not well defined, yet for the better understanding of the relationship of the authorities and officers to the work, the question should always be regarded from the two aspects.

In such a meeting as this, and at this stage in the development of tuberculosis work, it is unnecessary for me to describe in detail the clinical and hygienic questions involved. The object of our discussion is rather to define the spheres and relationships of the various persons and authorities engaged. The clinical and hygienic aspects of tuberculosis work, cannot, from the point of view of any public authority, either an insurance committee or local sanitary authority, be regarded as of equal importance, as the latter should be, at all times, the determining factor. It is of little use treating the sufferer, if he be an early curative case, in a well-equipped and modern sanatorium, if he, after cure, is to return to the conditions which gave rise to his illness, or if he be a later and more infectious case at home, if he be housed so as to be liable to spread the disease. It is on this account that, so far, as public work in tuberculosis is concerned, the recommendations of the physician must at all times be subject to the comment and recommendation of the hygienist. This does not mean any interference in, or control over, the clinical work of the physician by the hygienist, but it does mean that so far as the recommendations to public authorities of the course to be adopted in each case is concerned, the advice of the latter should prevail. Hygienists, in the persons of medical officers of health, are able to take a broader view of the needs of the community in which they are situated, and are able to direct more efficient weapons towards the

prophylactic treatment of this disease than even "treatment in sanatoria or other institutions or otherwise." Their work in the past, in tuberculosis, has met with much success, which fully justifies the position which they only are qualified to occupy in the new campaign which is being inaugurated. Since the notification of pulmonary tuberculosis has been made compulsory, the records in the possession of these officers show with the greatest exactness which it is at present possible to secure, the incidence of this disease in each area. It is hopeless to attempt to found, as apparently has been suggested, an anti-tuberculosis campaign upon casual applications for sanatorium benefit by the self-diagnosed sufferers. The incomparably more accurate records of notification must be made available for the purposes of the administration of this benefit, and it may be stated without fear of contradiction, that in those areas where the greatest number of subsequently justified applications for this benefit have been received, these records have been the most efficiently used. The records of notification ought to form the starting point of all tuberculosis work, and, by the proper investigation into the notified cases, the great majority of early and suspicious cases are discovered.

Coming to the authorities which deal with this subject, in the area of county boroughs no difficulty need be found in the administration of the work. In such an area, with its own local sanitary authority and its own local insurance committee, the relationships of the *personnel* engaged can be readily arranged. The most important aspect of the work is that of public health, and the officers engaged in it therefore should be essentially health officers, and should take their definite and clear place in the public health department as tuberculosis physicians. In their clinical work they cannot be subject to any control, and are bound to express an unbiassed opinion of the greatest value in subsequent procedure. A well-trained tuberculosis physician, if he has a thorough knowledge of preventive medicine, will, I believe, be regarded by medical officers of health as an asset of the greatest assistance in their work. The essential points to be understood to bring about a proper co-ordination in the work are that (1) the tuberculosis physician should be on the staff of the medical officer of health and subject to his administrative control; (2) that while he acts independently clinically, his work, as affecting the cause of the spread of the disease and other

matters of hygiene, should be under the control and supervision of the medical officer of health, and (3) the advice to be given to any authority as to the use of sanatoria or other institutions or otherwise, should be regarded, both as a clinical and hygienic matter, upon which, in the interests of the community, the medical officer of health should act as the final adviser.

In county areas the problem becomes more complicated. The county council is the body charged with the organisation of the scheme so far as it concerns treatment in sanatoria or other institution or otherwise, while urban and rural district councils are the bodies primarily concerned in the public health of their area, and are therefore vitally affected by the questions involved, and ought to occupy an important position in the scheme for dealing with tuberculosis. To set up an organisation in a county, differing in essential points in different areas, has I know been a task of enormous difficulty. The local medical officers of health ought to take their places in such a scheme, and in their own areas their well considered public health opinion ought to prevail. It is clear that the closest relationship must exist between the county medical officer of health and the local medical officers of health and the tuberculosis physicians, if good work is to be done, and I have no doubt that such co-operation can be secured.

It has been recognised from the first that a most important matter in this work is the securing of the co-operation of medical men in private practice in the efforts of public health authorities to combat tuberculosis. As to how this co-operation should be secured, well-marked differences of opinion have arisen within the past few months, largely from misunderstanding on both sides. The attempt of the British Medical Association to confine the energies of the tuberculosis physicians to diagnostic and consultative work only is, I believe, ill-advised. It is not in the interests of the work to displace the private practitioner in tuberculosis in his private practice, when this is carried out in accordance with the general scheme laid down, but to exclude the tuberculosis physician from taking any active part in the treatment at the dispensary is irrational, for the dispensary has been definitely set up as a centre for curative treatment under that officer.

So far as insured persons are concerned, the recently suggested alteration of the terms for the administration of medical benefit will materially change the attitude taken up by the

*Opening paper in a discussion at a meeting of the North-Western Branch, November 15th, 1912.

general profession on this subject. It is clearly the correct policy from a public health point of view, to make an inclusive payment to the medical practitioner to cover medical attendance in tuberculosis, for by doing so his medical opinion is quite certain to be unprejudiced by any consideration of private interest. The question, however, of the uninsured still remains, but local authorities are unable, through lack of funds, to provide for medical attendance in tuberculosis in this class along the lines of the proposed settlement for the insured, but the terms suggested for the insured clearly form a precedent when the extension of medical and sanatorium benefit is made to dependants. Medical officers of health are by no means antagonistic to their professional brethren in private practice, and will further their interests as far as it is possible to do, while carrying out their professional duties, but it is, I fear, impossible for them to agree to all the principles and demands of the British Medical Association in this matter, for many of these demands are opposed, not only to the best interests of public work, but also to the best interests of the profession itself.

THE WELFARE OF THE DEAF.

SCHOOL MEDICAL OFFICERS may like to have their attention directed to the National Bureau for Promoting the Welfare of the Deaf. This Bureau, of which the founder is Mr. Leo Bonn, has its offices at Gwydir Chambers, High Holborn. We have just received the report of the Bureau for the year 1911-12, this being the first report which has been issued. Its object is to be a centre of information concerning all matters relating to the deaf. In a large degree it is concerned with the educational side of this work and with the promotion of their social condition. Thus the increase of opportunities for their employment is one of the chief concerns of the Bureau and the medical aspects of the subject, the prevention of acquired deafness, for instance, finds a fitting place in its programme. The Bureau is in relation with all organizations which are interested in the welfare of the deaf and engaged in the amelioration of their condition. It is providing for the giving of lectures which have this object, and reprints of two of these lectures, by Dr. J. Kerr Love, have been published.

DR. FREMANTLE, medical officer of health of Hertfordshire, has been selected as candidate for membership of Parliament for the Borough of Stockport. Dr. Fremantle's ripe experiences of public health questions admirably fits him for the position he seeks, and he would, undoubtedly, be able to render useful services in connection with any legislation affecting this or other social subjects.

A CRITICISM OF THE ATTITUDE OF THE MEDICAL OFFICER OF HEALTH AND THE GENERAL PRACTITIONER ON THE ASTOR SCHEME.*

By HENRY MALET, B.A., M.D.,
Medical Officer of Health, Wolverhampton.

MUCH of what is said in the following as regards the proper attitude of the medical officer of health applies to a theoretical state of things rather than to that which exists in most sanitary districts except the larger ones, and only relates to whole-time officers.

When the medical inspection of school children came forward I deprecated the medical officer of health personally undertaking the work on two grounds—viz., first, that so far as his training and experience were "special" they did not fit him for it; and, secondly, that the mere fact of his undertaking it was a confession that he was already insufficiently employed. At the same time, I maintained that it should come within the work of the department of public health, and be under the general supervision of the medical officer of health. My position was justified by the fact that in most instances in which the medical officer of health undertook this work an assistant was specially appointed, and in the larger districts the only connection the medical officer of health has with the work is supervisory.

Now, the appointment of tuberculosis officers is to the fore, and I regret to find the same attitude assumed by many medical officers of health—that they should be the tuberculosis officers. There can be no misconception as to the ideal tuberculosis officer as a clinical special expert in the diagnosis and treatment of phthisis, and a whole-time official. I endorse the idea that the tuberculosis officer should be subordinate to the medical officer of health, and his department part and parcel of the public health department; but that the medical officer of health should have the capacity and the time to act as tuberculosis officer is an assumption quite inconsistent with his training and experience, and an admission of unemployment, which seems to me a very serious one to make, besides being one which is quite opposed to facts.

I consider that the medical officer of health should be well-up in the latest phases of work, able to advise concerning it, and to generally supervise it; but to expect him to carry out details in practice is absurd.

* Read before the Midland Branch on November 7th, 1912.

In judging the attitude of the general practitioners to the suggested schemes some preliminary considerations must be made.

Much of the work done in public health directions has been largely at the expense of the general practitioners, *e.g.*, the hospital isolation of infectious diseases has deprived them of considerable income. I think everyone must recognise with what readiness this has been accepted in the public interest. There is some suspicion that the incomes of the general practitioners are likely to be encroached upon in the treatment of school children.

The whole temper of the profession at the present time is justifiably one of angry resentment in consequence of the attempted gross injustice of the Insurance Act. It is difficult for an individual in such a temper—still more difficult for a collection of individuals—to give unprejudiced consideration to a problem apparently seriously affecting their personal interests.

There are two points which must be kept in view in estimating the relation of the general practitioner to any scheme for dealing with consumption. First, that much of the suggested work is so completely new, that even if undertaken entirely by officials it would deprive the general practitioner of very little profit at present enjoyed by him. I have heard it maintained by practitioners that the Chancellor's plea in excuse for his low grant, that he was relieving the doctor of the drudgery of attending on phthisis cases, meant little, as the attendance on such cases was so slight. The great mass of cases attended by officials under any new scheme would be either of contract patients or such early cases as at present are not attended at all. And the methods of treatment would also be completely new.

The second point is this: that when public health authorities are undertaking any special work they must carry out such work in the public interest in the most economical way compatible with efficiency. If the public health authority considers that by paying a special officer a liberal salary, such as will secure a thoroughly capable man, they can get any special line of treatment carried out more cheaply, and at least as efficiently as by paying a number of individual doctors the minimum fee which the doctors would find it worth their while to accept, then we cannot reasonably object to the authority adopting the first method.

We must bear in mind the ultimate relation that the Insurance Committees will have to the above. It will be merely one of paying the public health authority for their work so far as it has been done for insured persons. All the problems relating to insured persons applying to the Insurance Committee for sanatorium treatment will have ceased, for all such persons will be already under treatment by the authority as such.

All cases of phthisis are reported to the medical officer of health and should be promptly inquired into. It should be the rule to let doctors understand that reports would be welcome of cases of the least suspicion. When a reported case was being inquired into every judicious effort should be made to ascertain if any other persons had suspicious symptoms. These inquiries should be made by a special inspector or by nurses. If the medical officer of health considered that the circumstances of the case required it, treatment by the public health authority should be offered and urged. Where the social circumstances were such that treatment, whether sanatorium or tuberculin, or both, could be carried out at the patient's home or otherwise privately, such cases should be left in the charge of their own doctor. At present many doctors are successfully carrying out such treatment. When facilities are afforded, as they must be, for observing such treatment at municipal dispensaries and sanatoria successful practice will become even more general.

When the medical officer of health considers the cases cannot be dealt with privately they would be referred to the tuberculosis officer. There should be a tuberculosis officer in charge of a dispensary, with a few beds, and a staff of nurses. The sanatorium should be as large as possible and have a resident doctor.

This is merely a rough sketch of a scheme in order to endeavour to define the positions of the whole-time officials and the general practitioner. It seems more profitable to do this than merely to criticise impracticable suggestions.

The tuberculosis officer should examine all cases at the dispensary, and if necessary keep them in bed there for a few days for temperature observation and tuberculin test. He should refer them subsequently for either sanatorium, dispensary or home treatment. Every case should have a course of sanatorium residence as early as possible which, when possible, should last long enough to enable

subsequent treatment to be at the dispensary. That is to say, the patient should afterwards attend the dispensary for tuberculin and other treatment, thus being kept under observation, and also be visited by nurses at his home. This treatment would include all the early cases, the convalescents, and most of the arrested cases.

The remainder would consist of the small number of cases remaining at home, such as they who may be prevented by fever from getting out, a few advanced cases too ill to get about, and cases of acute complications such as hæmoptysis. The last mentioned cases, where hospital removal was not available, would need to be treated by a private doctor, in consultation with the tuberculosis officer when required. In the public interest the advanced and hopeless cases would be best treated in hospital, but I doubt the practicability or the wisdom of sending hopeless consumptives into a hospital. Probably the majority of such cases would do as well if watched by nurses, supervised by a weekly visit from a private doctor. The febrile cases ought really to be in the sanatorium, and if early cases they would be there. If the fever was due to any complication they would fall under the heading of acute complications.

The idea of home sanatorium treatment by open windows, or in shelters, introduces a larger number of cases requiring home medical treatment than I have allowed for above.

I feel sure, however, that as sufficient accommodation in sanatoria is provided, such home treatment will be limited to cases well enough to visit the dispensary occasionally, or to cases who prefer and can afford to pay for their own medical treatment.

Official treatment will never be popular with a certain class; and I think that in common with charitable hospital treatment it ought not to be made too popular, assuming, as we are bound to assume, that the majority of medical men are capable of efficiently treating their own cases.

In the public interest the sanatorium and dispensary should be open freely to the observation of all qualified medical men, and the public health department should give them every facility for acquiring experience.

The public health tuberculosis department should keep careful clinical records of all its cases.

We, as a profession, are frequently in the invidious position of maintaining that something to our great advantage is of still greater

advantage to the public. This assumption of altruism is a very delicate position, and easily open to sarcastic criticism. I confidently believe that the assumption is almost always an absolutely sound one. I cannot, however, quite see the force of what appears the main argument in favour of the practical work of a public health tuberculosis scheme being done mainly by general practitioners, viz., that a case of phthisis would be kept continually under the observation of the family doctor. I certainly do not think that such advantage would be sufficiently great to justify a public health authority expending the enormous sums that would be needed to pay reasonable fees for such private attendance as compared with the expenditure on officials, and yet I place a high value upon the family friendship between the doctor and his patients, and it is with extreme regret that I notice it passing away.

DISCUSSION.

DR. SNELL said that these questions raised by Dr. Malet had been brought into prominence because of the cardinal points laid down by the British Medical Association in connection with sanatorium benefits under the Insurance Act. There were many difficulties in harmonising the attitude of the general practitioner and the public health department. These difficulties would have to be straightened out. It was, he said, no part of their duties as medical officers of health, to see that the Act, as an Act of Parliament, worked smoothly, but they were intimately connected with sanatorium benefit. One of the cardinal points was that the tuberculosis officer should confine himself to diagnosis and consultation work, but it seemed to him that if the tuberculosis officer confined himself to this work it would not be long before the advice of the tuberculosis officer would not be worth seeking. Dr. Snell said that as a general rule the man whose opinion was worth having was the man who did the most treatment. He deprecated the policy of the Government in singling out one particular ailment for exceptional treatment in the matter of payment. Dr. Snell was very grateful for the restrained way in which Dr. Malet had introduced the discussion. Medical officers of health, however, could not be grouped together as a class of practitioner apart from the general practitioner; many, in fact the great majority of them, were in private practice. At the present time a large number of medical men were qualifying themselves to undertake this work. This, he said, was a most important point if tuberculin were as valuable as some thought. It was a most dangerous drug. Fees were being paid and there was a danger that some medical men were without sufficient experience.

DR. BARWISE (Derbyshire) said he was in a difficult position in that he had persuaded his County Council to adopt a scheme for providing sanatoria and dispensaries for the whole county, a scheme which would involve a cost to the county of a halfpenny rate. He thought his Council had done splendidly in adopting the scheme. His scheme was worked out on the assumption that there would be 1s. 3d. for every insured person, which would bring in some £11,000 per year, but the Chancellor of the Exchequer had taken 6d. out of the 1s. 3d., which amounts to some £4,800 per year, and as this had upset the financial basis on which his scheme was built up he doubted whether they would be inclined to go on with it in its entirety.

There was one good thing to be said for the new move, that there would be no friction between the local authorities and the general practitioners as to the cost of giving domiciliary treatment for consumption. In adopting any scheme they ought to make arrangements that all special appliances, apparatus, and laboratories should be available for the benefit of the population of the whole country.

They should arrange that the doctors could make use of the county laboratory for the preparation of vaccines, and that the appliances and apparatus of the Council should be available for the doctors for their private patients as well as for insured persons, and that tuberculin should be sent out to them for their private patients at the cost price of the tuberculin, the County Council giving the services of their officials in advising the tuberculin, if asked, and the dose of it, measuring the dose and sending it out in sterilised capsules, so they would see that the doctors would have a great deal to gain by working with them.

The new programme had also to be said for it that gradually they would be spreading the idea of tuberculin treatment, and would be helping the practitioners in the county to become *au fait* with it. So also if they wished to see radioscopes of their patients' chests they should place the apparatus and staff at their disposal, and if they wanted radiographs they should take them, and charge the bare cost.

At first sight the announcement of the Chancellor of the Exchequer came to Dr. Barwise as a shock. He had looked upon domiciliary treatment as giving the patients in the future no more than they had had in the past; but by linking the doctors up with the county laboratory and the sanatoria, fitted up with all the latest appliances on the lines hinted at so that the medical practitioners in the county could take an important part in the new movement, they would be really starting a scheme that in the long run had great possibilities.

DR. REID said that he was very glad to know that Dr. Malet agreed that the medical officer of health should only have administrative duties in connection with sanatorium benefits. With regard to the proposals of the British Medical Association, he said that the cost of tuberculin treatment by a general practitioner would be 10s. per week per patient—2s. 6d. a visit, 2s. 6d. an injection, and two injections per week, apart from the cost of the tuberculin, with which the practitioner expected to be provided. Dr. Reid pointed out the vast excess in cost of a scheme such as this and the schemes for tuberculin treatment at dispensaries now in operation in many towns.

The capitation payment of 6d. for domiciliary treatment now proposed by the Chancellor of the Exchequer would, he thought, get over this difficulty. The reason why 1s. 3d. was fixed as the figure to cover sanatorium benefit was that on first framing the Act the Chancellor of the Exchequer thought the treatment of tuberculosis was to be mostly in sanatoria, therefore, he estimated what it was going to cost to keep patients in sanatoria for lengthened periods, but he found he was mistaken, and that he must include various methods of treatment. By earmarking this 6d. for domiciliary treatment, the Chancellor of the Exchequer thought the tendency would be to get patients to sanatoria rather than keep them for treatment at home. Something would, said the speaker, have to be done to spring a little more for sanatorium benefits, other than domiciliary treatment, in view of the 6d. being taken from the 1s. 3d.

It was a question not only of consumption but of tuberculosis generally. Surgical tuberculosis, he thought, would be largely dealt with by domiciliary treatment and by treatment in general hospitals. Some provision must be made for such hospital treatment of tuberculosis cases other than phthisis, and very soon some sort of proposal must come for subsidising the hospitals to provide the necessary treatment. With regard to Dr. Barwise's proposal of sending temperature charts to dispensaries to enable tuberculosis officers to send tuberculin to practitioners, he would not like to say that the sending of the chart only was sufficient to warrant the use of tuberculin without consultations from time to time between the practitioner and the tuberculosis officer.

DR. MABYN READ said that he only gave up general practice two months ago, and he now held the office of medical officer of health and tuberculosis officer. He had been in a position for some time past of gaining experience of tuberculosis, as he had been an examiner at the county sanatorium for some years. He was in the position of a medical officer of health who might take up this work. As regards the demand of the general

practitioner for special terms he put it to them that they did not ask for special terms for the injection of anti-toxin in cases of diphtheria which they treated at home, and because tuberculosis had been made a notifiable disease he did not see that there were any special grounds for them asking for special fees for the injection of tuberculin. His Health Committee had taken up the question of the control of tuberculosis with enthusiasm. He thought it would be found that, in the larger towns, there was a large number of cases who had not seen a doctor for the last twelve months, and therefore had not been notified, and a great many of them were chronic cases of some years' standing. When told they had tuberculosis, they had made no effort to get well and had not sought further advice. Dr. Read did not think that anyone knew as yet the extent of chronic cases existing. In Worcester they had about 300 cases of consumption, but he did not think their death-rate was any worse than other towns. If the Insurance Act had been in force eighteen months, he said that a large number would have been insured persons, as many of them were out of employment at the passing of the Act because of their disease. The impossibility of paying the fees asked for by the British Medical Association, he said, was obvious to anyone; it was quite beyond small towns to pay fees on that scale. The work could be done for very much less by whole-time officers.

The general practitioner could treat cases with tuberculin if he would take the care. So far as the injection went, that was a simple matter, the difficulty would be what suited the particular person, and that knowledge was only gained by experience. The chief difficulty seemed to him to be what should the tuberculosis officer do with the severe cases? If all the "open" cases among the poor were isolated because of their danger to the community, the number of beds required would be very largely in excess of the number named in the Astor Report, and yet such cases were well known to be careless in their habits and unable by reason of their sickness to earn such wages as would enable them to maintain their health if discharged from hospital.

DR. RIDLEY BAILEY said that when the Chancellor of the Exchequer brought out his scheme the treatment of tuberculosis was not included, but was to be regarded as an extra. Hence the British Medical Association had to discuss and, as far as possible, arrange what the fees should be for visits, reports, etc. The latest scheme suggested in the Chancellor's speech to the Advisory Committee was an improvement, because it fixed a definite sum for this work, and thereby did away with the alleged necessity of checking the amount of attendance given to patients and any bargaining as to the amount of

the fees, etc. With regard to the offered capitation fees for these cases, he took it that each practitioner on the panel would receive 6d. extra for every insured person on his list, and would have to take his chance as to the number of these he might have to treat for this disease. This, of course, only applied to domiciliary attendance, for treatment at sanatoria and dispensaries would still have to be provided. Patients, in many instances, ought not to be allowed to remain at home and power should be given to compulsorily remove them, where necessary, to the sanatorium or hospital for the safety of the members of their families and the general community, just as is done with other infectious diseases, such as scarlet fever, when thorough isolation at home is impossible.

He did not think the medical officer of health should, as a rule, be allowed to act as tuberculosis officer, but exception should be made in those towns where the population and area were such that by a combination of the two positions a whole-time appointment, at a proper salary, could be arranged, provided always that the medical officer was properly qualified by training and experience to undertake the treatment of such cases. With regard to tuberculin there would be no difficulty when dispensaries were once started.

DR. A. BOSTOCK HILL, although he thought the discussion had been extremely interesting, was of the opinion that the members had somewhat wandered from the subject on the agenda. It was obvious that there must be a divergence of views between the medical officer of health and the general practitioner. Medical officers of health were paid officers of the public for the purpose of looking after the public health. The medical officer of health was not looking after himself as the general practitioner was quite rightly doing. One of the ways in which the difficulty had been made was that the British Medical Association had taken on itself to be the spokesman of curative medicine as against preventive medicine. As in the case of the medical inspection of school children, the difficulty had been largely solved by the curative and preventive parts of the profession coming together. The medical officer of health was not an individual with defined and distinct duties; the problems he had to solve differed immensely where there was a town with a large population to those met with in a county area. Take for instance, he said, the suggestion which had been made for the giving of facilities to the general practitioner to learn modern methods of giving tuberculin treatment in large towns; in a county this would be very difficult. In a town it would be possible to get to a dispensary without difficulty, but in the county the problem would be an extremely difficult one.

DR. McCrindle said that he had not yet submitted to his authority any permanent scheme for dealing with tuberculosis. For the last six or eight years his authority had been sending patients to sanatoria at the expense of the ratepayers. His Council had not refused to send any case which he had recommended. For about the same period they had dealt with cases in the later stages, having set aside wards for their isolation. He had now 12 beds at his disposal for this purpose. His experience differed from that of many others, in that he had no difficulty in keeping these beds full, and, indeed, had a long waiting list. He did not think that under the revised proposals of the Chancellor of the Exchequer the medical practitioners in Northampton would be very anxious to take on the domiciliary treatment of the disease. He did not see how the attitudes of the medical practitioners and the medical officers of health were to be fully reconciled, except through conference locally.

DR. MALET briefly replied on the points raised.

THE NATIONAL HEALTH WEEK.—It has been decided to hold another Health Week in 1913, and April 6-12 has been selected as the date. It is desired (as before) to obtain the assistance of the local health authorities, national and local societies and of voluntary helpers. The National Health Week Committee particularly desires that local celebrations shall be carried on in harmony with the wishes of the responsible health authorities. It is mindful also of the great success of the 1912 health week in those towns where the medical officer of health took the matter actively in hand. It is therefore communicating in the first instance with the medical officers and it sincerely trusts that as many of them as possible will again place themselves at the head of the movement in their respective districts. It is recognised, however, that the arrangement and carrying out of a full programme for the week will involve more detail work than can in many cases fairly be thrown on the Local Health Department. The Committee therefore proposes to avail itself as before of the various voluntary health agencies and individual workers, to form local committees where the medical officer does not desire to have the work done in his own office, requesting such local committees to place themselves in communication with the medical officer as their first step, so that even in these cases the official head of the local health administration may at least be in touch with and guide the movement. The committee would be only too glad to receive the comments and suggestions of the medical officers and would be grateful if such communications and some indication of their views, could be sent them addressed to the National Health Week Committee, the Agenda Club, 19-23 Oxford Street, London, W.

THE NEED FOR INFANT MANAGEMENT BEING GIVEN A MORE IMPORTANT PLACE IN THE MEDICAL CURRICULUM.*

By H. SCURFIELD, M.D., C.M., D.P.H.
Medical Officer of Health of the City of Sheffield.

IF I am told at the outset that I have chosen a wrong title for this paper, and that the title should have been "The need for infant management being given a place in the medical curriculum," I am quite prepared to acknowledge my mistake, but as there may be some medical schools which devote some little attention to this matter, it may be as well to keep to the title as announced.

It may be objected that the medical curriculum is already overcrowded with subjects. I think, however, we shall all agree that this subject is so important that room must be found for it and other less important subjects must take a back seat.

I should like to say at the outset that I do not lay claim to any special knowledge on the subject excepting to a knowledge of the prevailing ignorance and to an appreciation of the fact that this most important subject has been, practically speaking, hitherto regarded as outside the domain of medical science.

During the years I was in practice I was appallingly ignorant of the details of infant management, and my subsequent experience leads me to believe that I was not exceptional in this respect. I had no children of my own and it was before the days of Infant Consultations, and my state of ignorance, though crass, was blissful. As my teacher, Sir Alexander Simpson, has lately made confession of his remissness in failing to teach this important subject it behoves me to humbly follow his example by confessing my failure to learn.

Infant management is not included in medicine or surgery, but is supposed to be included in midwifery. It may have a page or two devoted to it in midwifery text books, while chapters are devoted to obstetrical freaks which the general practitioner may come across once in a lifetime.

As the result of Infant Consultations and the writings of men who have devoted special attention to the subject, we are beginning to realise that such matters as the management of breast-feeding cannot be left to the instinct of mothers, aided by the advice of more or less ignorant grandmothers.

In medical jurisprudence we used to be taught that the baby had rights almost equal to those of the mother. For example, it was laid down that if a woman with a pelvis so deformed that she could not have a baby born in the natural way became pregnant the first

* Read at a Meeting of the Society of Medical Officers of Health held on November 15th, 1912.

time, the baby was to be broken up, but if she became pregnant a second time caesarian section was to be performed. It is almost ludicrous to insist so strongly on the rights of the unborn child, if after birth it may be gradually and insidiously done to death by some process of artificial feeding undertaken perhaps quite unnecessarily owing to a carelessly managed cracked nipple.

Medical officers of health and special committees on infant mortality frequently report that excessive infant mortality rates are due to the ignorance of the mothers, but the fact is that there is nobody to teach the mothers.

The doctors are not taught, and the midwives are not taught.

Dr. Eric Pritchard has recently commented on the shortcomings of the Metropolitan Midwifery Schools as regards the management of the infant, and has made the valuable suggestion that at each training school for midwives one member of the medical staff should be told off to instruct the pupils in infant management. The difficulty at first would be, no doubt, to find members of the staff capable of giving this instruction.

There can be no doubt that we must begin by teaching the doctors. If we follow that by teaching the midwives, the mothers will have a chance of learning later from doctors and midwives.

Other countries are devoting much thought to this question of infant management, and it is time that we woke up to our needs.

There is no reason to suppose that maternal instinct is a worse guide than formerly. I believe, if we consult old church registers and other records of the past, we will find that in the days when everybody lived in the country there was an enormous infant mortality.

We are simply face to face with a new requirement of civilisation.

The shirking of breast-feeding by pleasure-seeking mothers may be a new feature of so-called civilisation. There can be no doubt, however, that, in order to combat this and the abandonment of breast-feeding for totally inadequate reasons, intimate knowledge of details by the medical practitioner is necessary.

We are assured by Dr. Pritchard and those who know that the management of breast-feeding is a very difficult matter.

As medical officers of health, we all know the lamentable results of artificial feeding, and I must refer you to the writings of Dr. Pritchard, Dr. Naish, and others for details of the altogether inadequate reasons for which breast-feeding is given up.

One of the best ways of realising the chaotic state of medical knowledge on infant management is to form one of a committee of doctors gathered together to draw up a pamphlet of "Advice" to mothers on infant feeding. All doctors cannot be expected to mount of

but one does expect some agreement on cardinal principles.

In the case of medicine and surgery, the teaching of the schools is more or less uniform, and each newly-fledged medico starts from the same point, his ultimate attitude varying within reasonable limits according to his experience. In the case of infant management, however, there being no teaching, he picks up ideas as he goes along, perhaps from monthly nurses and mothers, perhaps from experience of his own children; and there is, therefore, nothing surprising in the widely divergent views which result from such empiricism.

If each medical practitioner began his career with a good substratum of knowledge on this important subject, and if such knowledge was also imparted to each midwife in the course of her training, I believe we should soon see results in the reduction of infant mortality, and it is for this reason that I have brought this matter before you to-day. I hope, therefore, that you will have no difficulty in adopting the resolution which I will conclude by moving:—

"That, with a view to the reduction of infant mortality, the Council of the Society be asked to consider the best method of securing that the subject of infant management be given a more important place in the medical curriculum."

DISCUSSION.

THE PRESIDENT, in declaring the paper open for discussion, alluded to the fact that in the United States all deaths of infants less than seven days old are eliminated from the register. He emphasized the importance of the resolution moved by Dr. Scurfield and suggested that it should be sent up to the Central Midwives' Board.

DR. REGINALD DUDFIELD (Paddington), in seconding the resolution, dwelt upon the educational value of pamphlets specially written for mothers and referred to the successful results attained in his own district by the publication of a booklet on "Infant Rearing," which had already reached its fifth edition. Referring to the elimination by the United States Authorities of infants less than seven days old he pointed out that in France, Holland and Belgium all infants presented dead to the Mayor were counted as still-births.

DR. J. MEREDITH (Wellington, Somerset), said that it was a pleasure to support such a resolution as the one submitted to the meeting by Dr. Scurfield. There was need of concerted action, both in general care of infants as well as in feeding them. These infants, as all recognised, varied vastly in their constitutional susceptibilities; whilst one may speak of standardizing drugs and other matters, there can be no thought of standardizing our little ones. Every year it was satisfying to notice that attention was being increasingly directed to children's needs. When one, like himself, had to study the question in the interest of his own children, and, later on, in that of his children's children—not to mention the interest of those met

within the common round of general medical practice—the question must ever remain an all important one. Like other members of the Society he had written and printed notes bearing on the subject. These related to mothers' inability to breast-feed their babies. Many mothers in certain localities were incapable of doing their duties in this respect, owing to a mistaken but cruel injury inflicted upon their mammary glands when they, themselves, were new-born babies. He referred to what was known as "breaking the nipple strings" in the case of female children—usually resorted to soon after birth. A deformity was brought about—the little teat, in consequence, did not develop, because of the severe manipulation to which it had been subjected. He had often met with such cases in Somerset, and learnt from reliable information that it existed in Devonshire and other places in the West, and some parts of the Midlands.

This "breaking the nipple string" practice was not known in the North of England, Scotland, or Wales, and he could find no literature bearing upon it, but was of opinion that it was a very old custom, and as harmful as it was useless. He added further that through his connection with the Somerset County Council as chairman of its Midwives' Act Sub-Committee, he was able to find out, from inspectors and trained nurses, a great deal about the superstitions and customs of older midwives, and others who approved of their doings. Some of them persisted in the practice, notwithstanding official admonitions sent them, and advices to discontinue such doings.

PROF. A. BOSTOCK HILL (Warwickshire) considered the resolution of very great importance, but the overcrowded state of the curriculum presented great difficulties in regard to the Chair to which the subject should be allotted. At the same time they should not forget that the majority of the births in the country were not in the hands of the general practitioners, who were not consulted in regard to infant feeding. The question was one for the midwives. He pointed out that in his county women who were both nurses and qualified midwives were specially engaged in dealing with the subject of natural feeding. They gave the midwives five or six lectures, employing models, diagrams and tables, with the result that a great improvement in the way of natural feeding was resulting.

DR. F. E. FREMANTLE (Hertfordshire), in supporting the resolution, endorsed the remarks made by the previous speaker in regard to the teaching of midwives. He stated that in Hertford they had a Home where twelve months' special training was given, including midwifery, and district nursing, with a special short course before the midwives went up for their examination. They were now inaugurating a School for Mothers. He considered it would be of great value to send up the resolution to the Central Midwives' Board, but urged the meeting not to lose sight of the medical man himself.

DR. FRANCIS VACHER supported the motion, and considered that it was only natural to suppose that in the curriculum the teaching would be taken up either by the lecturer on midwifery or in conjunction with diseases of children.

DR. W. A. BOND (Holborn) congratulated Dr. Scurfield on his paper and expressed the hope that the resolution would be productive of some practical results in the future. They should not forget, however, that a very large percentage of infants were not attended at all by the medical profession.

DR. A. M. N. PRINGLE (Ipswich) emphasized the necessity of something being done to ensure proper training for the students in the medical schools.

DR. W. J. BUTCHER (Bedford), considered that it should not be merely a question of extra lectures, but that attendances at special clinics should be possible for medical students.

DRS. FAIRFIELD THOMAS, BEALE COLLINS, C. SANDERS and A. H. BYGOTT also supported the resolution.

DR. SCURFIELD, in reply, expressed his gratification at the discussion which had resulted from the reading of his paper. He would like to refer briefly to some of the remarks made by those who had taken part in the discussion. One speaker had mentioned the necessity for attention to ante-natal conditions. He (Dr. Scurfield) quite realised this need and had thought that the resolution would cover it. For example, the preparation of the nipples for breast-feeding during pregnancy was obviously part of the management of breast-feeding. Dr. Dudfield had referred to the value of booklets on "Advice to Mothers." In Sheffield a booklet of this kind had also been issued with good results, and it was in the preparation of this booklet that he (Dr. Scurfield) had realised the extraordinary ignorance which prevailed among medical men and women as to infant management. In the preparation of such a booklet they naturally went to experts for advice; the result was that the general practitioner who had not had the advantage of conferring with experts did not, perhaps, agree with the advice given in the booklets. This exemplified the necessity for the general practitioner being better instructed in the details of infant management before any real progress could be made.

Dr. Scurfield agreed with Dr. Bostock Hill as to the necessity for the instruction of the midwives, but thought they ought to begin with the doctors. Otherwise they would be in the anomalous position that the midwives would know more about the subject than the doctors. There were very few doctors at present who were possessed of the necessary knowledge for instructing the midwives.

In reply to several speakers, Dr. Scurfield of course realised that in the management of infants the individuality of each infant must be considered, but he also realised that the consideration of the needs of the individual infant must be based on knowledge and not on ignorance. The establishment of "Baby Consultations" in different parts of the country had been most valuable in demonstrating the general ignorance which prevailed on the subject of the management of infants. Children's hospitals did not deal with the subject of the management of the normal infant, but they endeavoured to put right the infants which had been made ill by bad management.

The motion was then put to the meeting and carried unanimously.

AN OUTBREAK OF GASTRO-ENTERITIS.

By A. T. NANKIVELL, M.D. (Lond.), D.P.H.
(Camb.), Etc.,

Medical Officer of Health, St. Austell Rural District

ON July 11th 1912, a public tea was held after a religious meeting at the Wesleyan school-room in Middle Treviscoe, St. Stephens, Cornwall. The tea took place about 6 p.m., and lasted until 7. Two kinds of "tea" were provided:—"Plain tea," consisting of tea, bread and butter and cake; and "high tea," with ham, fowl, and beef added to the list. About 160 people were present at this public tea.

Early next morning many of these began to feel ill, with nausea, diarrhoea, acute abdominal pain of the nature of colic, chilliness and prostration. Most of the attacks began between 2 a.m. and 8 a.m. In the majority of cases the illness was transitory in nature, the men were able to go to work and the women to see to their household duties—indeed, by the evening of July 12th, most of the affected people were well again. In some eight or nine cases, however, the illness continued for varying periods up to four days. In all about 57 people were taken ill after this tea.

Most unfortunately my attention was not directed to this outbreak of illness until July 19th, more than a week after it was all over. I visited Middle Treviscoe on July 19th, 20th, and 24th, and made enquiries as to the outbreak.

I found a widespread belief throughout the village that the illness had been caused by the tea having been poisoned, or by poison having been added to the water with which tea was made. There was some local jealousy it seemed on the matter of the entertainment, and since no outbreak of illness of this kind had happened before, nor was within the understanding of the villagers, they attributed the same to malevolence on the part of some detractors of their religion, regarding the affair very much as a successful practical joke.

The room in which the entertainment took place is situated about 50 yards from the tap which supplies water to the village. Water from the tap was carried to the schoolroom for tea-making purposes over night in a barrel on a small trolley, and left outside the back door of the school. Next day it was poured into an open boiler—a large pan, set in concrete—and in this it was boiled, the boiler being replenished from the barrel as more hot water was

needed. From this boiler a pipe led the water into the tea-room. I took samples of the water from the barrel, and washings from the boiler, and examined these by Reinsch's and Marsh's tests for arsenic and antimony, to which such gastro-enteritis symptoms as prevailed might point. Neither of these metals were present. The collapse and prostration and the length of some of the illnesses could not, I think, be attributable to the addition to the tea of any ordinary purgative—although one person in the village affirmed that the tea tasted of salts, while another was equally certain that it tasted of jalap. In passing I may say that others of the villagers are quite sure that the tea tasted like ordinary tea.

I made a house-to-house visitation over the countryside and obtained the exact details of the food eaten by 79 people who had been present at the tea. Subsequently, as the result of 22 letters, I obtained details from 34 more people, making in all a total of 113. Of these people 28 ate the plain tea and 85 ate the high tea.

Of the 28 who ate a plain tea, none were ill; of the 85 who ate high tea, 57 (67%) were ill. The illness therefore can be referred to some article of food eaten at the high tea, but not at the plain tea. Meat—ham, fowl, beef—alone was peculiar to the high tea, the other articles of food consumed being common to both teas. The eating of meat then at this Treviscoe tea caused the subsequent outbreak of enteritis.

The question now arose of deciding to which variety of meat the enteritis was due—whether to ham, or fowl, or beef,—and here I was met with the difficulty that most people eat more than one kind of meat. There were, however, four people who ate ham alone—none were ill; three people who ate fowl alone—two were ill; and twelve people who ate beef alone—ten were ill. These figures seem to show that two kinds of meat were infected, namely the beef and the fowl.

Passing to a more minute analysis of the mixed diets of those who ate a "high tea," I found that:—

Of the 85 who ate a "high tea":

Ham was eaten by 54 people—	33 ill = 61 per cent.
Fowl " " " 55 " "	33 ill = 60 " "
Beef " " " 56 " "	42 ill = 75 " "

Of the 56 who were not attacked:

Ham was eaten by ...	24 = 43 per cent.
Fowl " " " ...	17 = 30 " "
Beef " " " ...	14 = 25 " "

Of the 57 ill:

Ham was eaten by ...	33 = 45 per cent.
Fowl " " " ...	38 = 66 " "
Beef " " " ...	42 = 74 " "

A further analysis of the food taken by the 56 persons who were not taken ill, shows that:

No meat was eaten by ...	28 = 50 per cent.
Ham only ...	4 = 7 " "
Fowl only ...	1 = 1.8 " "
Beef only ...	2 = 3.6 " "
Ham and Fowl only ...	9 = 16 " "
Ham and Beef only ...	5 = 9 " "
Fowl and Beef only ...	1 = 1.8 " "
Ham, Fowl and Beef ...	6 = 11 " "

A similar analysis with regard to the 57 persons who were ill gives the following result:

No meat eaten by ...	0
Ham only ...	0
Fowl " ...	2 = 3.5 per cent.
Beef " ...	10 = 17.5 " "
Ham and Fowl only eaten by ...	13 = 23 " "
Ham and Beef " " "	9 = 16 " "
Fowl and Beef " " "	12 = 21 " "
Ham, Fowl and Beef ...	11 = 19 " "

I account for the fact that only 57 people who ate meat out of 85 were affected, by the suggestion that the meat was not infected throughout. Parts of it only were bad.

An analysis was made of the number of cups of tea consumed, but such figures serve no useful purpose, as obviously the gastro-enteritis was due to meat and not to tea.

Although the incidence of illness was rather more heavy among those who drank more than one cup of tea, it may be supposed that these people were likely also to eat more meat—the more meat a man ate, the more tea would he be likely to drink.

The question now arises, how did the meat become infected so as to cause this epidemic? Two similar cases of gastro-enteritis occurred in the village a day or two before the tea, and I suggest it is more than probable that the meat was infected from those cases, and almost certainly through the agency of flies. The weather was warm and moist, and flies were present in the village in abundance. These two previous cases occurred within half a mile of where the meat was cooked; and the meat was stored after cooking for more than 24 hours before the tea. As the village excrement is collected in pails and pits, the flies have every opportunity of breeding and carrying infection when it is present. Four more cases occurred ten days after the tea, and were also probably due to the infection from some of the previous cases.

Since my attention was called to the epidemic so long after its occurrence, I was unable to obtain samples of the meat, nor could I obtain samples of faeces from three persons whom I

asked. As Gaertner-like organisms are easily overgrown by bacillus-coli, I did not think it worth while to collect samples of faeces from the privies in the village. Moreover, unfortunately, there is no bacteriological laboratory in my district.

My thanks are due to Mr. F. H. Trim, B.Sc., London, who put a chemical laboratory at my disposal, and assisted me in the examination of the water samples for arsenic and antimony.

CONCLUSIONS.

1. The above outbreak of gastro-enteritis was due to the eating of infected meat.
2. The collected evidence seems to show that more than one kind of meat was infected.

CORRESPONDENCE.

The Editor does not accept responsibility for the opinions of correspondents.

TUBERCLE AND THE MILK SUPPLY.

(To the Editor of PUBLIC HEALTH.)

Sir,—The *Journal of Tropical Medicine and Hygiene* often supplies facts that throw a most important side-light on our home problems of public health. In the issue of August 15th, 1912, the supplement, in which colonial medical reports are summarised every week, gives extracts from the medical report for the Seychelle Islands. Under the heading of "Tuberculosis" we find that whereas in former years the Creole population was very susceptible to the disease, and one death out of nine in one particular area was from this cause, the disease has now declined, and not a single one of the 26 deaths, or 367 admissions, in the Victoria Hospital in the last year recorded were due to any form of tuberculosis.

In the issue of December 16th, 1912, Dr. Tertius Clark, Perak, refers to this fact, and suggests the absence of tuberculous cattle. He records that in the Malay Peninsula there are no tuberculous cattle, and that in 15 years he has not seen a case of lupus or tubercle of bone or joints. "In (his) opinion the tubercle question in the tropics is one of human infection only, and therefore a far simpler one, than it is in temperate climates."

It would be well if we bore definitely in mind the increasing evidence of the rôle of milk in the causation of these forms of tuberculosis if the new Milk Bill and provisions for compensation of slaughtered cattle should pass into law: and we are called on to undertake the not very easy, but obviously important, problem of stamping out tubercle in cattle.

Yours faithfully,

F. E. FREMANTLE.

December 19th, 1912.

TUBERCULOSIS SCHOOLS.*

II.

IN schools for tuberculous children the provision of adequate food and of rest is a matter of vital importance. The Dispensary Committee was most anxious that the provision of meals at the school should not form part of the scheme. The arguments on which that view was based are as follows:—

(1) Since the dispensary deals with each child rather as a member of a consumptive family than as an individual case, it desires that the family as a whole should have adequate nourishment rather than that one member of it should be given meals at school.

(2) That where it is found impossible for the family as a whole to obtain adequate nourishment, it is preferable to put them in touch with philanthropic agencies, such as the Charity Organisation Society, rather than that one child should be given separate meals at school.

(3) That school dinners at the best only provide one good meal a day, five days a week, and some nine months a year.

(4) That educationally it is far better that the parents should realise their responsibility for their children's health and be taught how to choose and prepare cheap and nourishing food for them.

(5) That if the latter method were successful, the benefit derived for the children would be far more permanent.

At first all children were encouraged to return home for dinner, but as such arrangement was found to interfere with the midday rest, those who lived at a distance and those having temperatures above the normal were told to bring their dinners to school, when such as were fit to be taken hot were warmed in the kitchen. Many of the children brought dinners quite unsuited to their needs.

To induce parents to fulfil their part in the treatment of the children, the voluntary visitors attached to the dispensary gave up their other work for the time being, and concentrated their efforts on the improvement of the children's dietary. Each family was visited and their budgets investigated. A dietary was drawn up by the medical officer, and a very great improvement in the food provided was secured. Records were kept by the school nurse of the dinners brought to the school, and many mothers supplied information as to the food provided at home at each meal.

The provision of school meals was, however, strongly pressed by the Board of Education, and finally the Dispensary Committee gave their consent to dinners being provided—thus falling into line with the other London special schools. The school nurse does the catering under the supervision, as regards foodstuffs, of the medical officer. She has been able to provide the dinners entirely out of the

children's payments—2d. per day. The class of dinners provided is sufficiently illustrated from the following records of the first week:—

TWOPENNY DINNERS SUPPLIED AT SCHOOL.

Wednesday, December 13th.—Leg of mutton, potatoes, sprouts, and bread. Rice pudding.

Thursday, 14th.—Stewed beef and carrots, turnips and onions, bread. Tapioca pudding.

Friday, 15th.—Tripe, onions and milk sauce, potatoes, bread. Bread pudding.

Monday, 18th.—Boiled silverside of beef, potherbs, potatoes, bread. Rice pudding.

Tuesday, 19th.—Pea-soup, leg of mutton, potatoes, bread.

Wednesday, 20th.—Stewed steak with potherbs, potatoes, and bread. Bread pudding.

Thursday, 21st.—Steak and kidney pudding, haricot beans, bread. Rice pudding.

The children now spend the whole day—from 8.45 a.m. to 4 p.m.—at the school, and they thereby get the advantage of the full amount of rest prescribed for them, viz., 1 $\frac{3}{4}$ hours. The dining-room will accommodate only half the children at a time, and to meet that difficulty the following schedule has been drawn up:—

	Boys.	Girls.
Resting	11.30—11.45	11.30—12.15
Toilet	11.45—12.0	12.15—12.30
Dinner	12.0—12.30	12.30—1.0
Resting	12.30—2.0	1.0—2.0
Toilet	2.0—2.15	2.0—2.15

The rest is supervised by the teachers and nurse, and the children are not allowed to talk, but encouraged to go to sleep. The children rest out in the open as a rule, but are allowed to do so in the house, but not in the classrooms, if the weather is very bad.

The home conditions of the children are investigated by the school nurse and medical officer. The nurse records the hygienic conditions of the home and the economic condition of the family. She is directed to correct unsatisfactory conditions and instruct the parents in the value of fresh air, cleanliness, nourishing food, etc. She revisits the home to see that unsatisfactory conditions are rectified, failing which the case is to be reported to the Dispensary Case Committee. The medical officer visits the homes to supervise the work of the nurse, and to discover and deal with unrecognised sources of infection.

The school has the same school terms as other London schools, but during the summer vacation there is a "summer school" on the premises, which is staffed and managed exclusively by the Dispensary. The educational part of the summer school is mainly practical, including cooking, washing, scrubbing, sewing, drawing, painting, basket-making, gardening, etc. Dinners are not provided. Many of the

children in regular attendance at the school are sent away to the country for varying periods.

There are two possible tests of the success of the school *quâ* health of the children, viz., the numbers of children debarred from the ordinary school routine and the physical development of the children as indicated by increasing body weight. When grading was first set up it was no uncommon occurrence to have from 20-30 children wearing the blue

badge—that is, spending their whole time at rest. At the end of 15 months the usual number was 5 in any week.

With regard to body weight, it should be premised that all the children are tuberculous, and that in the majority of them the weight was stationary, if not actually decreasing. Bearing those facts in mind, the appended table is eloquent proof of the benefit which the children have derived by the treatment at the school:—

Average gain in weight (in pounds) of the children in each of the five classes during:—	Class I.		Class II.		Class III.		Class IV.		Class V.		Whole School.
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Both Sexes.
Second half of Summer Term=8 $\frac{1}{2}$ weeks ..	+ '03	+ '78	— '16	— '88	+ '31	— '12	+ '93	+ 1'21	+ '22	+ '61	+ '29
Summer Vacation=4 $\frac{1}{2}$ weeks	+ 1'1	+ 1'87	+ 1'23	+ 1'05	+ '76	+ 1'1	+ 1'32	+ 2'47	+ '42	+ '48	+ 1'18
First half of Xmas Term=9 weeks	+ 1'2	+ 3'32	+ 3'21	+ 2'12	+ 2'47	+ 3'2	+ 1'1	+ '83	+ 2'33	+ 2'79	+ 2'32
Second half of Xmas Term=8 weeks	+ 1'47	+ '91	+ '79	+ 1'27	+ 1'5	+ '41	+ '1	+ '44	+ '94	+ '6	+ '84
Xmas Vacation=2 weeks.. ..	+ '66	+ 1'24	+ '46	+ '29	+ '16	+ '46	+ '66	+ '75	+ '2	+ 1'49	+ '64
First half of Easter Term=10 weeks	+ 2'26	+ 2'25	+ '82	+ 1'03	+ 1'12	+ 1'09	+ 1'49	+ '25	+ '93	+ '12	+ 1'14
May, 1911, to March, 1912=42 weeks ..	+ 7'42	+ 10'27	+ 6'35	+ 4'88	+ 6'32	+ 6'14	+ 5'6	+ 5'95	+ 5'04	+ 6'09	+ 6'41

THE NATIONAL INSURANCE ACT AND VOLUNTARY HOSPITALS.—An interview took place on December 16th 1912, between the chairman of some of the larger London hospitals having medical schools and the Chancellor of the Exchequer. Various points were discussed regarding the effect of the Insurance Act in relation to voluntary hospitals. The Chancellor explained that the main work of the hospitals is not touched by the Act, inasmuch as the treatment afforded to insured persons under the Act is such treatment as can properly be given by a general practitioner of ordinary competence and skill, whereas this is just the kind of treatment that a hospital does not exist to give. Thus insured persons need as much as ever the aid of hospitals in order to obtain the treatment that is given in the in-patient departments and to a substantial extent that given in the out-patients' departments, (e.g. all that for which special medical or surgical skill is required). Thus hospitals would only be carrying out their proper duty in continuing to give this treatment. Those subscriptions, donations, and legacies, on which the hospitals have depended would be needed as much as hitherto, and they would have the same claim on the support of the benevolent.

The Chancellor said that the question of hospitals had been by no means overlooked in planning the Government Insurance Scheme; but that it had been deemed wiser to endeavour to avoid any steps that would imperil the voluntary nature of the great hospitals of this country. This could not have been avoided if hospital work had been brought into the scheme of the Act, since a subsidy from public funds would necessarily be followed by some degree of public control. He understood that the hospital authorities were greatly desirous of continuing the voluntary system unimpaired; and, if the position of things under the Act regarding hospitals is properly understood, it will be seen that no fears need be entertained on this score from the Act. Certain special points were also submitted for the Chancellor's consideration regarding the effect of the Act upon the financial position of the hospitals, to which he promised consideration. The following hospitals were represented by their chairman:—Charing Cross Hospital, Guy's Hospital, King's College Hospital, London Hospital, Middlesex Hospital, Royal Free Hospital, St. Bartholomew's Hospital, St. George's Hospital, St. Mary's Hospital, St. Thomas's Hospital, University Hospital, Westminster Hospital.

* Part I. appeared in the issue of November last. See page 52.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856. RECONSTRUCTED 1888.
INCORPORATED 1892.

AN ORDINARY MEETING of the Society of Medical Officers of Health was held at the offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, December 13th, 1912, at 5 p.m. Present:—Professor E. W. Hope (in the chair); Drs. Sir Shirley Murphy, Herbert Jones, F. E. Wynne, E. H. Snell, P. W. Spaul, E. F. Thomas, A. Ball, J. Tate, F. W. Bywater, W. J. Butcher, R. E. Lauder, William Butler, Duncan Forbes, A. Mearns Fraser, J. Tubb-Thomas, T. Ridley Bailey, J. D. McCrindle, A. E. Porter, J. S. Tew, J. M. Clements, R. H. Wilshaw and S. C. Lawrence.

MINUTES.—The minutes of the previous ordinary meeting held on November 8th, 1912, and published in PUBLIC HEALTH (December, 1912, p. 85) were taken as read, approved and duly signed by the Chairman.

ELECTION OF FELLOWS.—The following candidates, who had been duly nominated, were balloted for, and were declared by the President elected:—

Catherine Boyd, B.A., M.B., B.Ch., D.P.H., Public Offices, Enfield; Alexander Bremner, M.B., Ch.B., D.P.H., Public Health Offices, Golspie, Sutherland; A. H. G. Burton, M.D., B.S., D.P.H., 4, Scott Park Road, Burnley; James Hamilton, L.R.C.P. and S.E., D.P.H., Lifford House, Dartford, Kent; W. R. Honeyburne, M.B., B.Ch., D.P.H., 15, Cambridge Street, Saltburn, Yorks; G. W. Nield Joseph, M.D., B.Ch., D.P.H., 19, Palmyra Square, Warrington; R. Walpole Murphy, B.A., M.D., B.Ch., D.P.H., 19, Queen's Road, Linthorpe, Middlesbrough; C. Clifford Pickles, M.R.C.S., L.R.C.P., D.P.H., 69, Commercial Street, Norton, Malton; R. Leslie Romer, M.R.C.S., L.R.C.P., Ravendene, Great Stanmore, Middlesex; Thomas Sanctuary, M.D., L.R.C.P., L.R.C.S. L.S.A., 31, Middle Street, North, Great Driffield; William Wright, M.B., Ch.B., D.P.H., Union Hospital, Ashton-under-Lyne.

NOMINATIONS.—The Honorary Secretary read a list of nominations for election to the Fellowship of the Society.

PRESENTATION OF PORTRAIT.—A letter was read from the Hon. Secretary of the Midland Branch, asking on behalf of the Branch if the Society would accept a portrait of Prof. A. Bostock Hill for inclusion in the Society's collection of portraits of past Presidents.

The President, on behalf of the Society, said that he would have very great pleasure in accepting the offer of the Midland Branch.

Dr. F. E. Wynne then read a paper upon "Observations of temperature in school children with reference to the diagnosis of infectious disease." The following members took part in the subsequent discussions for President (Professor E. W. Hope), he has been Thomas, A. H. Bygott, Fairfield T. entirely out of yes, and J. M. Clements.

* To be published in the February Number last. See page 57.

Midland Branch.—A meeting of this Branch was held on Thursday, December 5th, 1912, at 3.30 p.m., at the Council House, Birmingham. Present: Dr. J. Doig McCrindle (in the chair), Drs. T. Ridley Bailey, J. W. Miller, J. Fortune, John Robertson, A. Bostock Hill, H. Gibbons Ward, R. W. H. Jackson, Jean R. Shaw, Ernest Hill, H. R. R. Fowler, J. M. Cowie, E. S. Robinson, J. Dale, G. A. Auden, Armley Ashkeny, E. Beards, C. J. Coleman and E. H. Snell. Apologies for absence were received from Drs. Henry May and Petgrave Johnson.

Dr. C. J. Coleman, medical officer of health, Lincoln, opened a discussion on "Meat Inspection." This was joined in by Drs. J. W. Miller, J. Fortune, J. Robertson, and A. Bostock Hill. The President also spoke and Dr. Coleman replied.

On the proposition of the President, it was unanimously resolved to ask Dr. Bostock Hill to allow the Branch to offer his portrait as a Past-President of the Society to be placed in the meeting room of the Society in London.

Yorkshire Branch.—A meeting was held at the County Hall, Wakefield, on Wednesday, the 18th December, 1912. The following were present:—Dr. A. Anderson (the President), occupying the chair, Drs. Clark (Leeds), Forsyth (Bradford), Moore (Huddersfield), Richmond (Wakefield), Russell (Todmorden), Smith (York), Sutherland (Wakefield), Sutherland (Cleckheaton), Wiltshire (Hemsworth) and J. R. Kaye (Wakefield), Hon. Sec.

After the election of five new members, Dr. A. Anderson of the Wortley Rural District, delivered his Presidential Address, the subject being "The Public Health Administrative Unit."

Dr. R. Veitch-Clark, of Leeds, then gave an interesting description of a case of diffuse carcinoma in a sheep simulating tuberculosis, and some excellent slides were exhibited.

The next item on the agenda paper, relating to the relationship of the medical officer of health, re domiciliary treatment of consumptives was postponed to a future meeting. Attention was, however, drawn to the circular of the Local Government Board, dated the 6th December, 1912, where particulars are given under the heading of preventive measures (page 2), as to investigation into the source of infection, the search for contacts, and enquiry into housing conditions.

Home Counties Branch.—The third meeting of the session was held at the Society's Rooms, 1, Upper Montague Street, Russell Square, W.C., on Wednesday, December 11th, 1912, at 4 p.m. Present: Dr. Howarth, President (in the chair), Drs. Paterson, Clements, Stevens, Ball, Tate, Stalker, West, Warren, Porter, Tew, Kirkhope, Robinson, Stovin, Beale Collins, Thomas, Strain, Heggis, Ponder, and George F. Buchan (hon. secretary).

Dr. Ponder, County Bacteriologist, Kent, read a paper on "The Diagnosis of Diphtheria Specimens by Examination of the Direct Smear."

Dr. Ponder also gave a practical demonstration of the staining method he employs, and a microscopic demonstration of the results obtained. Drs. Clements and Porter contributed to the subsequent discussion, which was replied to by Dr. Ponder. A vote of thanks to Dr. Ponder, moved by Dr. Beale Collins, and seconded by Dr. Tew, concluded the business of the meeting.

LAW REPORTS.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

November 28th, 1912.

BEFORE BANKES, J., AND A COMMON JURY.

MIDDLETON AND WIFE v. HALL.

Housing Town Planning, etc., Act, 1909, Sec. 15—
House not reasonably fit for human habitation
—Injury to wife of tenant—Liability of landlord

The wife of a tenant of a house which is not reasonably fit for human habitation cannot recover damages from the landlord for injuries occasioned thereby as the undertaking implied by Sect. 15 of the Housing Town Planning, etc., Act, 1909, is limited to the tenant.

This was a claim for damages for injuries occasioned to the wife of a weekly tenant by reason of her falling through a defective staircase, and was brought against her husband's landlord. A claim by the husband for expenses to which he had been put in connection therewith was also made but had been met by a payment into court, which had been accepted. The claims were based upon Sec. 15 of the Housing Town Planning, etc. Act, 1909, which provides that in contracts for the letting of houses at small rents there shall be implied "an undertaking that the house shall, during the holding, be kept by the landlord in all respects reasonably fit for human habitation."

The defendant contended that as regards the wife the section conferred no cause of action. BANKES, J., expressed his dissent from the rights conferred by the section on the wife and did not extend to third parties.

CO

SESSION.
DIVISION.

December 10th, 1912.

BEFORE THE LORD PRESIDENT AND LORDS KINNEAR,

JOHNSTON AND MACKENZIE.

SCHOOL BOARD OF GLASGOW v. ALLAN.

Education (Scotland) Act, 1908, Sect. 4, 6, Medical and Dental Treatment of school children—
Inspection and supervision.

A school board are not entitled under the provisions of the Education (Scotland) Act, 1908, to provide and pay for out of the school fund the cost of the medical or dental treatment of children attending schools in their district whether the parents of the children are able to pay for the same or not.

This was a special case presented by the School Board for Glasgow and by a ratepayer to have the question determined as to whether the Board were entitled to expend money out of the rates on the dental treatment of children in their schools. The Board had proposed to pay for such treatment out of the school fund, and so throw the expense upon the rates, and Miss Allan had threatened them with an action of declaration and interdict. It was therefore agreed to have the matter settled by a special case, and two specimen cases were taken, so as to test the question both as regards children whose parents could afford to pay for the treatment and those whose parents could not. The Board contended that they had power to provide and pay for the appropriate medical and dental treatment, either by providing the necessary apparatus and staff, and by sending the children to private practitioners or to institutions.

The Court decided against the conditions of the School Board.

The Lord President, after dealing with the facts, said that the powers of the School Board in the matter were contained in Sec. 4 and 6 of the Education (Scotland) Act, 1908. Section 4 empowered them to provide for the medical examination and supervision of the pupils attending schools within their district. The contention of the Board amounted to a substitution of the word "treatment" for "examination and supervision." They were not the same thing; if Parliament had meant "treatment" it could easily have said so.

This view was pressed home by two considerations. The first would be understood by looking at Section 6, which was a comprehensive section detailing what might be called all the general powers of the School Board, and was divided into sub-sections. Sub-section 2 dealt with the supply of meals. If it had been intended to give a general power of laying upon the School Board the medical and surgical—for dentistry was just one branch of surgery—treatment of children, he could not help thinking that there would have been a sub-section corresponding to Sub-section 2. The other consideration was found in the reflection as to the really enormous expense which might be incurred if the contention of the School Board was correct, for indeed there was no halfway house in this matter so far as power was concerned. It meant the whole expense of the medical and surgical treatment of all children of school age. It was no answer to say that the School Board might be trusted not to act foolishly and extravagantly in such a matter.

The Court had also been referred to a circular of the Education Department of 18th April, 1912, dealing with the sum of £7,500, which the letter bore to be assigned for the purpose of "medical treatment" of school children. He thought the phrase unfortunately used, for he thought it was absolutely clear that Section 6 dealt exclusively with what was to be done in the case of children who were, first, in a filthy or verminous state, and, secondly, who were underfed or underclothed, and did not deal with medical treatment at all, except so far as necessary to cure verminous conditions. This letter could make no difference in the meaning of the statute, but, further, it must be remembered that if the House of Commons chose to put a sum in the estimates, commit that sum to the Department, and allow them to spend it, it would need no statutory authority to allow the School Board to spend the money for the purpose for which it was given them. It was a perfectly different thing when they proposed to raise more money and charge it on the rates, and no Department and no resolution of the House of Commons could authorise them to do that. They must find powers in an Act of Parliament.

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VOL. XXVI.

WARFARE AND SMALLPOX.

WRITING of smallpox prevalences, Hirsch said: "There are, in my opinion, two factors only that determine the recurrence of an epidemic of smallpox: on the one hand, the necessary number of persons susceptible of the morbid poison and, on the other hand, the introduction of the virus itself." The experience of later periods requires that this view should be modified. Undoubtedly, smallpox has a tendency to become diffused at one time more than another, even if administrative measures are equally applied in both. Smallpox, like other infectious maladies—scarlet fever, for instance—varies in virulence. We may take as example its behaviour in this respect in the seventies of the last century and in the beginning of the last decennium. While the smallpox of the earlier period was characterized by a high fatality, that of the later period was characterized by a low fatality. With this difference in fatality there is probably associated difference also in the quality of infectiousness, and hence administrative measures which may be sufficient at one time may prove less effective at another.

It will be recollected that the 1871 epidemic occurred at the time of a disastrous war in Europe. Smallpox had broken out in the contending armies, and the French army, which was less well vaccinated than the German, suffered severely. There is much reason for thinking of the wide extension of smallpox at that time in connection with the war, and especially may we speculate whether the quality of virus was affected by the circumstances that troops were drawn from different areas, some of which may have included those in which a severe type of the disease existed.

This consideration teaches us to bear in mind the war at present being carried on between the Balkan allies and Turkey, and a recent statement in the press that smallpox had broken

out in and about Adrianople. Turkey has no doubt had necessity to draw troops from the Arabic provinces, and hence a variety of smallpox, different from that which has existed in Europe for a number of years, may have been introduced into Eastern Europe. If this has actually occurred we may later find a more considerable extension of this disease than has been observed for many years.

In connection with our administrative measures it may be pointed out that if smallpox of the quality we have in mind should be imported into this country careful watch should be kept over the influence upon the surrounding neighbourhood of the hospitals receiving the patients. Sir William Power's observations on the aerial extension of smallpox will not be forgotten, and it is a notable fact that while some observers have found reasons for thinking that evidence of such extension was not forthcoming in their own experience, a close examination of the facts upon which Sir William Power relied has left no doubt in the minds of others of the soundness of this hypothesis. Possibly it may be found later that quality of contagion is also a determining factor in the aerial spread of smallpox, and hence again we may think of extension of this disease from Eastern Europe, if such occur, as perhaps affording further opportunity for the study of this subject.

There can be no doubt that, apart from the question of vaccination, this country is now far better equipped for resisting invasion and limiting the spread of smallpox than in former times. It may be anticipated, moreover, that the facilities which the National Insurance Act gives for obtaining medical aid in cases of sickness will lead to advice being sought at an earlier period than heretofore, and to the information of incipient cases reaching the medical officer of health more promptly. Experience, however, will alone show how far under these conditions smallpox can be controlled.

REPORT OF THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD FOR 1911-12.

THIS report is of much interest and importance to every medical officer of health. It presents a review of the public health in England and Wales in 1911, and indicates the lines along which enquiry and improvement are likely to proceed. Charts illustrating the course of the death-rates from certain diseases are given, and these are valuable and very acceptable to the reader.

A comparison of the general death-rate of a country over a number of years serves as a guide to public health progress, and in this respect the steady fall in the corrected death-rate for England and Wales in successive quinquennial periods from 20.9 per 1,000 in 1871-75 to 14.7 per 1,000 in 1906-10 is eminently satisfactory. Not so satisfactory, however, is the fall in the birth-rate during the same period, and it is a point of national importance that as the death-rate has now fallen to a comparatively low figure there is less likelihood in the future of a low death-rate compensating for a lack of births.

The subject of infant mortality is briefly referred to as a special report on this subject has been presented already by the Medical Officer of the Local Government Board, and a second report is in course of preparation. Incidentally it may be noted that in the statistical reports of medical officers of health diarrhoea and enteritis under the age of two years shall be classed together as perhaps the most satisfactory measure of epidemic diarrhoea. In the Board's Table IV. for medical officers of health diarrhoea and enteritis are still to be kept in separate columns for a few years in order that the amount of interchange between the two can be judged. In 1911 the amount of fatal diarrhoea was greater than in any of the preceding ten years, and this is attributed to the protracted and almost tropical heat experienced during the summer months. The only summer during the last 40 years comparable to 1911 was that of 1899.

With higher temperatures there was less diarrhoea and still less total infant mortality in 1911 than in 1899. It would therefore appear that there is a good foundation for the belief that there has been a genuine reduction in infantile mortality during recent years. Too much stress cannot be laid on the importance of the Board's circular letter of August, 1911,

issued to sanitary authorities from year to year special taken during the third quarter excessive child mortality.

As exemplifying the possibility and historical health measures typhus fever is of special interest. It has now almost ceased to be a cause of mortality in England and Wales, and this result has been contributed to by prompt recognition, notification, isolation and improvements in housing and general sanitary conditions. Only 55 cases with 6 deaths of this disease were notified during the year.

It is to be hoped that the effective exhibition of sanitary methods generally throughout the country will reduce similarly the mortality from enteric fever within the next few years. 13,730 cases of this disease were notified during the year 1911. 2,383 deaths were registered, giving a death-rate of 7 per 100,000 for 1911 as compared with 33 per 100,000 during the decennium 1871-80. All parts of the country do not participate equally in this improvement, and special attention is called to the unsatisfactory positions of the counties of Durham, Lancashire, Northumberland, the West Riding of Yorkshire and Monmouth in this respect. A summary given by Dr. Wheaton shows to what an excessive extent enteric fever is endemic in certain localities under conditions which are capable of removal. The absence of shell fish, especially the causation of enteric fever, is a result of the representations of Birmingham, Sheffield, Leicester, Derby, Ipswich, and other towns the Board have under consideration the question of giving additional powers to sanitary authorities to deal with shell-fish beds subject to pollution by means of special regulations under the Public Health (Regulations as to Food) Act, 1907.

Measles and whooping cough are diseases which annually cause a very large death-roll, the incidence falling mainly on children under 5 years of age. Not only are these diseases important as causes of excessive mortality but they are frequently predisposing factors in tuberculosis, calling into activity disease which otherwise might have remained latent. In addition, it must be noted in the case of measles that it is an important factor in the causation of deafness. Curves shewing the annual death-rates from these diseases in England and Wales are given for the 20 years 1891-10. The curve for measles shows the

regular biennial epidemics of the disease and one of the major and more fatal epidemics characteristic of measles is noted as occurring in 1896. On the whole both the curve for measles and that for whooping cough show a marked tendency to decline, and it may well be assumed that this is at any rate in part due to the general movement in the direction of more intelligent care of infants and young children. The most hopeful line of action in respect of both these diseases lies in the hospital treatment of patients for whom adequate domestic nursing cannot be secured and in the improvement of conditions under which domestic nursing is undertaken. An important advance in this direction was made in regard to London during 1911, the Board authorising the Metropolitan Asylums Board to provide isolation hospital accommodation for measles under certain conditions.

Only 259 cases of small-pox with 23 deaths were notified during 1911. The report gives a brief summary of a series of cases of this disease traced to importation. The outbreak illustrates two common sources of small-pox infection, namely, a mild case not recognised on account of the apparently trifling nature of the illness, and a severe and fatal case not recognised as of hæmorrhagic type with prodromal rashes.

Cerebro-spinal fever and poliomyelitis occupy much space in the report. The epidemiology of both these diseases is not completely understood and the whole of the facts presented by Dr. Reece on the prevalence of acute poliomyelitis in Devonshire and Cornwall in 1911, by Dr. Farrar on outbreaks of disease affecting the cerebro-spinal system in the Midlands and Dorsetshire in 1910, and by Dr. Gordon on the pathological aspects of the subject, which are appended to the report of the medical officer, require the most careful study. The Order of the Board making both these diseases compulsorily notifiable will doubtless be the means of adding to our knowledge of their spread and prevention, while the further investigations of Drs. Andrewes and Gordon which have been sanctioned by the Board will be of material assistance in the same direction.

The necessity of providing hospital accommodation for cases of puerperal fever, ophthalmia neonatorum and erysipelas is referred to in the report of the medical officer, and may here again be emphasised.

The section of the report dealing with the administrative control of tuberculosis is of

especial interest at the present time. The final Report of the Royal Commission on Tuberculosis was issued in June, 1911, and it may be said that the main result of the Commission's work has been to prove the correctness of the view that tubercle bacilli of animal origin may cause disease in man, more especially in children; that, except in rare instances, pulmonary tuberculosis in adults is caused by infection of human origin; and that it is extremely difficult if not impossible to transform the bovine into the human type of bacillus by experimental methods. The importance of these findings cannot be exaggerated in relation to the work of sanitary authorities in connection with the Public Health (Tuberculosis) Regulations, 1912, which come into operation on February 1st, 1913. The inquiries to be made into cases notified under these regulations will naturally fall under several headings, including the conditions under which the notified case is housed and sleeps; the detection of cases in the same family; the investigation of possible sources of infection; and the provision of suitable treatment. It is in connection with the investigation of possible sources of infection that the finding of the Commission will become increasingly important, and further laboratory experimentation, for example, to determine whether cases of tuberculosis in children have been caused by bacilli of the bovine or human type, will be no doubt necessary. As to treatment, it is noteworthy that the medical officer of the Board lays it down as an axiom that prevention of the disease cannot be separated from the satisfactory treatment of each individual patient.

It is, therefore, of especial importance that the work of the various authorities concerned in dealing with tuberculous patients, or in making provision for them, that of the County Council, the Sanitary Authority and the Local Insurance Committee should be duly co-ordinated. This is less difficult in the County Boroughs than elsewhere.

As bearing on the extension of notification to non-pulmonary tuberculosis a table shewing the deaths from pulmonary and non-pulmonary forms of this disease occurring in England and Wales in 1910 shews that non-pulmonary tuberculosis, as a fatal disease, occurs chiefly in infancy and childhood, and its control offers a most hopeful field for further reduction of the death-rate in early life.

It is worthy of note that Birmingham, which was the first city to establish and maintain a

municipal sanatorium for consumptives, again takes the lead in connection with bye-laws for the control of expectoration in streets. The bye-law in question has been sanctioned by the Home Office after consultation with the Local Government Board under Section 23 of the Municipal Corporations Act, 1882.

The section of the report dealing with Food Inspection is written by Dr. MacFadden, and will repay study. It deals with the subject under four headings, namely, work in relation to the Public Health (Regulations as to Food) Act, 1907; local arrangements for food inspection; bacterial food poisoning; and work in relation to the Sale of Food and Drugs Acts. One point worthy of note may be here emphasised, namely, that good administrative measures taken in one district for controlling the wholesomeness of the food supply are sometimes discounted largely by circumstances existing in some neighbouring district. This is important, and illustrates the need for uniform sanitary administration throughout the country. The medical officer of the Board deals with this very urgent subject in discussing the relation between county and district medical officers of health and their authorities. Three different organizations of administration are presented, namely, the first, the redistribution of local sanitary areas, in such a manner that each unit is large enough to maintain a medical officer of health giving his whole time to public work; the second, the compulsory formation within each county of combinations of existing districts for the appointment of sanitary officers; and the third, the establishment in England and Wales of a county public health administration on lines similar to that of Scotland. To give full effect to any of these alternatives new legislation would be necessary. With regard to the second, the Board has had experience in 63 such combinations, and for various reasons they cannot be regarded as completely successful. With regard to the third, there are essential differences between counties in Scotland and England, especially as to size and population, and it may be that the administrative counties of England and Wales as now formed may not be thought to present the ideal units for sanitary purposes.

The vital statistics of sanitary districts in England and Wales are dealt with, mortality statistics being separated from sickness statistics. The importance of the National Insurance Act, 1911, in regard to the latter can hardly be over-estimated, and it is hoped that

by co-operation between Local Insurance Committees and Local Authorities such information in respect of the total sickness and of the varieties of sickness amongst insured persons as may be prescribed may throw light on the incidence of sickness, and the conditions under which it prevails, and thereby make still further preventive measures possible.

The auxiliary scientific investigations of the Board are worthy of special mention. Dr. Andrewes' contribution on arterial degeneration and its premature occurrence is the outcome of an analysis of the death-rate for the two sexes at different ages, which shows that the improvement in mortality has not taken place at all periods of life, the higher ages participating in it little or not at all, and that diseases of the heart and blood vessels were the registered cause of about one-third of the total deaths in the age-period 55-65. Doubtless rheumatism plays a large part in this death-rate, and further work on the natural history and causation of this disease is urgently needed.

Epidemic diarrhoea in children has been investigated by Dr. Lewis and Dr. Alexander mainly with regard to the "non-lactose fermenters" and Morgan's No. 1 bacillus in relation to this disease. The former investigator worked at Birmingham, and the latter at Liverpool, and a comparison of the results shows considerable differences in the distribution of the intestinal flora, non-lactose fermenters as a whole, and Morgan's bacillus in particular, being less abundant in the northern city. Dr. Graham Smith made a parallel investigation into the occurrence of non-lactose fermenters in flies.

The investigations begun in 1908 as to the possible carriage of infection by flies, have been continued by Dr. Graham Smith, while an interesting observation on the use of oil of cloves in the preparation of glycerinated calf lymph by Dr. Bloxall concludes a volume which is useful, instructive and suggestive throughout, and should receive the careful study and attention of every medical officer of health.

OBITUARY.

We regret to have to record the following deaths:—

DR. COOMBS, late medical officer of health for Newport, I.W.

DR. JOHN MACKENZIE, late medical officer of health, Kirkby-in-Ashfield.

SIR GEORGE TURNER.

THE announcement of the inclusion in the recent honours list of the name of George Turner will have been received with sincere satisfaction and pleasure by all connected with our Society. It is always gratifying to us to see one of our number selected for Royal approval, but in the present instance there are circumstances which make the honour of knighthood, which has been conferred, a matter of profound congratulation to all who desire to see recognition of the best qualities which man may possess. If anyone ever deserved all that could

from which the troops were suffering. Opportunity subsequently offered for him to study leprosy by becoming attached to the leper hospital, and here he devoted himself to efforts to alleviate the sufferings of the unfortunate inmates of the institution. Everyone who knows Sir George Turner will understand that no thought of risk to himself would deter him from such whole-hearted service as he believed to be necessary. His work involved not only the medical care of the patients, but the making of post-mortems, and the study of the pathology of the disease, with a view to acquiring knowledge he needed. His period of service came



SIR GEORGE TURNER, M.B., D.P.H., J.P.

be given him, and which could mark the approval and sympathy of King and Country, that man is Sir George Turner.

First, as to his work:—Sir George Turner was medical officer of health of Portsmouth, and afterwards of a combined district in Hertfordshire. Later, he entered the Civil Service of the Cape Colony, where among other duties he devoted himself to the discovery of a means of prevention of rinderpest, which was then producing disastrous results in the Colony. In this he was markedly successful. When the Boer War broke out, he at once placed his exceptional knowledge and experience at the disposal of the Headquarters Staff with the object of lessening the amount of typhoid fever

to an end, and he then returned to this country, where he continued his scientific investigations.

If this were all we had to say of Sir George Turner, we should fully recognise how completely he deserved the honour the King has conferred upon him, but it is not all, for the sadness of the whole story is, that Sir George Turner has himself contracted the disease with which his sympathy for suffering brought him into contact.

No one can think of Sir George Turner's work without a feeling of admiration, nor hear of the misfortune which has come upon him without a feeling of the most profound sympathy. No one honours him more than the body of men who are proud to claim him as one of themselves.

THE PUBLIC HEALTH ADMINISTRATIVE UNIT.*

By A. ANDERSON, M.A., M.B., D.P.H.,
Medical Officer of Health, Wortley Rural District.

THIS year is a critical one in the history of the medical profession, and the public health service cannot fail to be affected by the profound movement that is taking place in the relations of the profession to the State. The medical profession has at last been caught in the whirlpool of social unrest, and, whatever solution of the existing difficulties attending service under the Insurance Act may be arrived at, things can never be as they were in the medical world. The State, which has hitherto concerned itself mainly with measures for the prevention of disease, is now in various ways embracing within its purview the treatment of disease as well. This extension of State supervision must ultimately have the effect of making every practitioner, directly or indirectly, a worker in the cause of public health, for the protection of the health of the community is intimately bound up with the preservation of the health of its individual citizens. In this sense preventive medicine may be said to be coming into its own, and taking its rightful place in the general scheme of things. The arbitrary division of medicine into a preventive branch on the one hand and a curative branch on the other hand is much to be deprecated. There is no antagonism, rightly considered, between preventive and curative medicine, any more than there is between public and private work, or between eugenics and hygienics. It is only the manner in which medical practice has grown up that has given a semblance of conflicting interests and intentions. To reconcile the interests, to harmonise the motives, and to unite the energies of medical men is not impossible. But it will require large views of the whole problem on the part of the profession and the public, and wise guidance on the part of our Statesmen.

The opportunity has, I think, now arrived for the evolution of a national scheme of unification and co-ordination of all forms of medical work and endeavour, which, while being of inestimable value in promoting the public welfare, will not be detrimental to, nor will alienate the sympathies of, the profession as a whole. Such a scheme cannot, however, be evolved at a moment's notice. A process of hustle will not do. Hurried legislation and

Presidential Address read before the Yorkshire Branch at the meeting of December 18th, 1912.

journallese thinking are our fashionable legal and literary vices, and they are both unhygienic. Like bolted meals, they cause bad attacks of dyspepsia in the community. Our laws are no sooner made than they are amended; our dogmas are no sooner uttered than they are exploded. We are rushing for the millennium of national well-being, and we have no time for masticating, still less digesting, our legal and scientific meals. We are attracted by the fare provided; we glory in our legislative output, we hug our medical catchwords. The consequence is that we pass by the simple doctrines that want proving and the small legislative measures that ought to be placed on the Statute Book. We have had recently a surfeit of intricate and badly worded enactments, but we have not yet had, for example, any proper definition of a drain or a sewer. So in the realm of administration, the obvious defects have received little or no attention. But they are none the less important, and cannot any longer be ignored.

While, then, schemes are in the air for a State Medical Service, while all our old institutions are in the melting-pot, while Boards of Guardians are on the way to abolition and our general hospitals are in danger of being nationalised, there is one aspect of this revolutionary movement which has, curiously enough, been almost lost sight of, but which is of the first importance, namely, the need for abolishing the sanitary unit as it exists to-day, and for revising and improving the conditions of the public health service, especially in rural and small urban areas. Our own household must, first of all, be put in order. Now, in considering this question, it should be borne in mind that the health of the nation never has been a matter of other than national concern, and it is in these modern days less a local matter than ever. The increasing urbanisation of the population, the vastly improved means of inter-communication between one place and another, the increase in our over-sea trade, have, amongst other things, had the effect of making the sanitary conditions and administration of any particular district as much a matter of national as of local importance. The lax administration of any sanitary unit may be reflected in the whole country in a disastrous manner.

The medical attitude to disease, too, is different. It is no longer a question mainly of environment, of drainage and other nuisances, but of the movements and carrying powers, of

the habits and predispositions of persons. Whatever may be the true relation between environment and hereditary equipment, there is no doubt that the influence of environment is becoming less important as a factor determining the health of the individual. It is quite true that progress in the past has been due mainly to the effect of improved environment, to indirect measures against disease. Very little has so far been accomplished by direct measures. Hunting the microbe or the person who harbours the microbe is a fascinating sport, but the kills are few and far between. Yet there is a limit to the effect of improved environment, and it must be admitted that in not a few districts—though, unfortunately, this cannot be said of the West Riding—there is comparatively little that remains to be done by way of improving the external conditions under which people live. The work of the medical officer of health is, therefore, now more a personal matter, directed to the investigation of individual weaknesses and signs of potential ill-health, to detecting disease in its very earliest stages, to the searching for healthy infection-carrying individuals, and to the regulation of their habits. Public health is thus becoming more and more a matter that does not concern a local body as such. And it is difficult to see why, in all those questions that are of importance from a public health standpoint, small local bodies should have any judicial powers whatever.

Much criticism could not, however, be directed against the present system if the local authorities had proved themselves efficient and had competently carried out the duties assigned to them. Some people—such as the signatories of the Minority Report—talk as if the existing system of public health administration was all that could be desired, and they hold it up as a model to be copied. But they have surely made the mistake of confusing sanitary authorities with county councils, who are not sanitary authorities, but have had certain sanitary work thrust on them. Boards of guardians have recently been subjected to much criticism because they have not carried out their duties properly, and have failed to adapt themselves to modern ideas and conditions; but, surely, a much stronger indictment could be brought against sanitary authorities? Within the limits of their legislative powers boards of guardians have, I think, carried out their work much more carefully and efficiently than have district councils,

and this is the opinion of members who serve on both bodies at the same time. This is due partly to the fact that boards of guardians cannot move a step without being confronted with some definite Order or Regulation of the Local Government Board, and partly to the nature of their work, which does not give rise to so much personal feeling and prejudice. They are also subject to a much more careful and detailed inspection by the Government inspectors. This, no doubt, has its disadvantages, and has in some respects hampered the more far-seeing and enterprising boards; but from the point of view of efficiency the abolition of boards of guardians is not by any means so urgently demanded as the abolition of our rural and smaller urban district councils. These bodies have been weighed in the balance, and found wanting. They have, time and again, been pilloried by the Local Government Board for gross neglect and default; they have lately been subjected to the satiric shafts of the Chancellor of the Exchequer; yet they are still alive, and have even escaped the attentions of a Royal Commission. One would have thought that the numerous instances of default on the part of district councils that have been brought to light by the inspectors of the Local Government Board would have compelled our legislators to have devised long ago some effective remedy. But, apart from advice, ineffective threats, and the insertion of defaulting clauses in recent Acts, nothing of any consequence has been done. The latest attempt appears in the Insurance Act, where the inept, but truly British, method is sanctioned of giving power to still another authority to fine the sanitary authorities for excessive amounts of sickness in their areas. This is going one better than the clause in the Housing and Town Planning Act, where the servant of one authority is penalised for not giving information gratuitously to the servant of another authority. To what a pass has local government arrived in this country!

There are many other disadvantages attaching to the present system. One is that the existing sanitary areas are far too small for modern administrative purposes, and they are not in any way related to the areas of Poor Law unions or registration districts. Nor, as a rule, are their boundaries marked out with any scientific regard to watershed and drainage areas. Hence there is both statistical and engineering confusion.

A striking illustration of unscientific boundary-making came under my notice in connection with the recent extension of a large city. At one place the new boundary line was drawn along one side, not in the middle, of a main road, so that the whole of that part of the road has to be maintained by the district council. The levels were such that the drainage of new houses built on the district side of the road had no outlet except into the city sewer; but, worse than that, the drainage of some of the houses built on the city side of the road could not possibly get into the city sewer. That results from tracing the boundary line on a map without sufficient study of the contour lines or inspection of the locality.

There is also quite an unnecessary amount of overlapping in the work of local authorities. Instead of improving, it is getting worse. There are, for example, in many districts whole-time school medical officers traversing in some instances the same areas as the local medical officers of health, both going into the same schools, sometimes for the same, more often for a different, purpose. There is supposed to be co-operation between them; but is not this co-operation more a figment of the official imagination than anything else? The administration of sanatorium benefit will cause further overlapping, and the Milk Bill will probably have the same effect. Then there are health visitors appointed by district councils, school nurses appointed by county councils, lady visitors appointed by boards of guardians to visit the homes of boarded-out children and the children of parents in receipt of relief, all going over the same ground, and lady tuberculosis visitors will no doubt shortly be treading on their heels. School attendance officers and relieving officers together obtain valuable information regarding the bulk of the industrial population which would be most useful to sanitary authorities, and would be available if there were any sort of co-ordination of local work.

Another disadvantage of the present system is the want of uniformity of sanitary administration in adjoining districts and the impossibility of attaining it. Is it right, for example, that cowkeepers in one district should be under a more or less rigid system of veterinary inspection while those in an adjoining district are free from inspection altogether? Again, does anyone think it likely that town-planning will proceed apace in the West Riding with its 159 sanitary districts?

I need not say much regarding the anomalous position of the medical officer of health, who has, in effect, to criticise his own master, and report on his shortcomings to two or three higher authorities, and who has constantly to inspect, and report on defects on the property of members of the authority that employs him. Even if he had satisfactory tenure of office and were adequately paid, he could not have a peaceful life while such a Gilbertian state of things existed. Is there any other official in the kingdom who is placed in such an extraordinary position? Imagine the chaos that would result in the administration of the Factory Acts if the inspectors were employed and paid, in whole or in part, by the owners of the factories. The marvel to me is not that there is occasional friction between the official and his authority, but that it is not all friction. We are truly a phlegmatic race to have tolerated such a tragi-comic arrangement so long.

Looking then to the past and still more to the future, I think that a radical change in the constitution of local health authorities and in the conditions of the public health service, at all events in county areas, is urgently demanded. It is not, perhaps, easy to find a simple scheme of reconstruction. So many local and personal interests are involved and such a fetish is now made of local government that it will be difficult to slay the hybrid monster. Some find a remedy in the creation of a Government Health Department with a responsible Minister of Health at its head. Personally, I am not one of those enthusiasts who think progress is necessarily made by a mere change in nomenclature. So long as local authorities remain as they are it will not make much difference whether the Right Hon. John Burns is designated President of the Local Government Board or Minister of Health. That seems to me to be beginning at the wrong end. It is the local, not the central, body that has to be strengthened and endowed with greater dignity.

If, then, the local authorities are so weak and untrustworthy that no Government thinks of entrusting them with the administration of any new important departure in public health legislation, the powers that be should see to it that their multiplication is not sanctioned without the most cogent reasons being forthcoming. But, unfortunately, small urban districts are frequently being formed on some pretence of a hypothetical betterment in local government which rarely ensues. Dr. Newsholme,

speaking of inefficient units of administration, says "that 'some of the most flagrant examples are to be found in the West Riding, in which inefficient urban districts have been formed under the powers given to the County Council by the Local Government Act, 1888, which enabled them to carve urban districts out of rural districts within the administrative county, the Local Government Board having no power to prevent the formation of these inefficient districts unless the rural or urban districts concerned opposed the proposed action and appealed to the Board. At the same time, very little action has been taken by this and other county councils to act on their powers to form more satisfactory units for local government when the present units were obviously inefficient and extravagant.' The county councils have, therefore, in this respect failed to rise to the modern occasion, and have adopted the retrograde course of splitting up, instead of amalgamating, areas. The policy of amalgamation has a good deal to be said in its favour. It has been successful in the case of the Pottery Towns, and what does the extension of large cities mean but the amalgamation of the city with the surrounding urban or rural areas. The objection which is commonly raised to the formation of large sanitary units, which include urban as well as rural localities, is the difficulty of equable rating; but this is largely of the nature of a bogey, for there appears to be ample power in the Public Health Acts of forming special districts within that area for the particular purpose required. The fact is also overlooked that many of our large towns now include within their boundaries considerable rural areas, and nothing is ever heard after a few years of anomalies of rating. Sanitary districts might be amalgamated straightway without losing any of their powers, or they might be combined for the purpose of carrying out all their duties that are of sanitary import, leaving their other functions intact, such as the maintenance of district roads, the provision of recreation grounds, public libraries, museums, baths, etc.

The best scheme, perhaps, would be to remove all their sanitary duties from existing councils, and to throw them on the county council. It is, of course, indefensible that there should be two authorities in the same area, each with sanitary powers limited in one or another direction. The evolution of local government has, moreover, tended to concentrate all really important matters in the county

council. This development seems to be, on the whole, on right lines. I do not say that county councils are above criticism. I do not admire some of their methods any more than I respect some of their motives. But the larger the body the less parochial it tends to be, and the less chance is there of petty personal interests predominating to the detriment of the public weal. Such a system has worked well in Scotland. In England some of the counties have become so populous and the work thrown on the county councils has so increased of late years that few men can be found with the necessary leisure for committee work, and the real power in consequence rests in the hands of a few men. In this sense the county council is not a truly democratic body; but so far as health matters are concerned it is none the worse for that. This difficulty could be easily surmounted by dividing the county into wards or districts, each district being administered by a district committee, on whom the necessary powers would be conferred. The unification of all sanitary and related sanitary work could then easily be attained.

Other methods of solving the problem seem to me to be either partial in their remedial value or impracticable. Some good would undoubtedly be accomplished in the way of stimulating local authorities if, after the manner of the Housing Regulations, definite regulations were drawn up by the Local Government Board, and enforced in regard to other branches of public health work. Government by regulation has its advantages. The Housing Regulations have given a greater impetus to the systematic inspection of, and the carrying out of structural improvements in, dwelling-houses than all the Housing Acts put together. An extension of this principle would be useful, though it would not promote the unification of areas and offices, which is so desirable.

The giving of Government grants to local authorities as a bonus for efficient administration and as an aid in the provision of works of sewage, or water supply, or in the erection of working-class dwellings in small localities, where the expense of providing these is out of all proportion to the rateable value, would also be beneficial; but these could be granted equally to the larger as to the smaller units.

The combination of districts for the purpose of appointing a whole-time medical officer of health is good so far as it goes; but it does not go very far so long as the existing sanitary units remain.

The ideal, so far as the medical officer of health is concerned, would be the establishment of a real State health service, the medical officers being appointed and paid by, and responsible only to, the State, as the factory inspectors are. This may sound somewhat Utopian, but I see no inherent difficulty in an arrangement of this sort. If no alteration were contemplated in the existing authorities it would be far better than any security of tenure of office. This has to some extent improved, but is not yet entirely satisfactory. Dr. Newsholme thinks that "efficient sanitary administration demands the extension of satisfactory conditions of tenure of office"—and I should add, "the superannuation of sanitary officers"—and "the most satisfactory settlement of the problem will come in connection with the establishment of efficient units of local government." The time is now, I think, ripe for a solution of this administrative problem. Preventive medicine has been placed on a high pedestal, and we cannot allow any part of the masonry to be defective or insecure.

CITY OF NOTTINGHAM.—Dr. Boobyer's report for 1911 is specially noteworthy for the amount of detail given and analysis carried out in connection with the various causes of death. A considerable increase in the number of deaths from cancer is noted, and on the question of the relation of improved diagnosis to this Dr. Boobyer points out that the deaths ascribed to cancer of the skin, respecting the diagnosis—of which there is not likely to have been at any time much difficulty or doubt—have remained singularly uniform in number year after year. Diarrhoea, enteric fever, and tuberculosis are all very fully considered. In connection with enteric considerable improvements are noted, which are ascribed to the fact that pail-closets are rapidly disappearing, and water-closets taking their place. In the appendix an exceedingly interesting special report on pail-closets is reprinted, and in the introductory letter it is noted that the council have arranged to assist owners to bear the cost of conversion of such closets into water-closets. Other special reports reproduced relate to tuberculosis, and deal with sanatorium benefit and the tuberculosis dispensary. The percentage of births notified under the Notification of Births Act was 68.2. Up to the present persons failing to notify have not been prosecuted. Dr. Boobyer, however, considers that the time for bringing legal pressure to bear has arrived. The inspectorial staff, though apparently small, accounted for a considerable amount of work and great improvements, especially in the matter of housing, are looked for in the future.

THE TREATMENT OF SCARLET FEVER BY STREPTOCOCCAL VACCINES.*

By NORMAN H. WALKER, M.B., B.S., London, M.R.C.S., L.R.C.P., D.P.H.,

Late Assistant M.O.H., Willesden, and Deputy Medical Superintendent, Willesden Isolation Hospital.

THE Scarlet Fever problem is one that may be looked at from many points of view, and these vary according to the particular branch of the medical profession in which the observer is engaged.

Of the many difficulties encountered, that of diagnosis is perhaps the most common.

Anyone who has had to make a definite diagnosis in cases of doubtful scarlet fever on the first occasion of seeing them, whether he be general practitioner, medical officer of health, or superintendent of an isolation hospital, must at times have felt the want of some positive test for the disease.

Similarly all will agree, I think, that we badly require some reliable means of judging when a case is no longer infectious.

At the present time, if a case of the disease gives rise to a "return" case either of the "hospital" or "home" denomination, the primary case is known to be still infectious or to have developed a recrudescence of infectiousness—a not uncommon occurrence, as Dr. Butler, of Willesden, has pointed out. This, as a test for infectiousness, is positive but extremely unfortunate when verified.

In the case of diphtheria the bacteriological examination enables one to make a certain diagnosis in doubtful cases, and aids one to decide when isolation is no longer necessary. When the causal organism of scarlet fever is certainly discovered, similar help should be forthcoming in the case of the latter.

The immense amount of research work that has already been undertaken on the bacteriology of this disease has, I think, left many unconvinced that the *Streptococcus Scarlatinae* of Drs. Klein and Gordon or the *Streptococcus Conglomeratus* of Kürth is really the causal organism.

Since the Hendon outbreak in 1885, when Dr. Klein isolated streptococci from the blood during life in four out of eight cases examined by him, which organisms he identified with those obtained from lesions on the udders of the cows, numerous attempts have been made to bring in a verdict of guilty against one

*A paper read at a meeting of the Home Counties Branch of the Society of Medical Officers of Health.

particular branch of the streptococcus family.

The case still remains unproven.

At the present day we do not even know that the disease really is of streptococcal origin.

Recent inoculation experiments on monkeys by workers on the Continent suggest a likelihood that the organism of scarlet fever is of ultra-microscopic dimensions, and some observations recently made point very strongly to the presence of antibodies to an unknown virus in the blood of scarlet fever patients during the first week of illness. Even if the virus of scarlet fever is an ultra-microscopic organism and not a streptococcus, the fact remains that streptococci have from time to time been isolated from the throat, the nose, purulent discharges, the urine and the blood during life, and from the heart's blood and solid viscera post-mortem in cases dying of the disease.

Sometimes the observer has been able to identify the organism isolated from these various situations with the *streptococcus scarlatinae*, while in other cases he has been unable to distinguish it from *Streptococcus Pyogenes* or *Streptococcus Erysipelatis*. Moreover, one observer, as the result of his work, will conclude that the streptococci he has been investigating have no relation to the cause of scarlet fever, and another will decide there is a fair chance that those he has been working with are causally concerned in the disease. After Dr. Gordon had demonstrated the important fact that streptococci are the most abundant organisms in normal saliva and likewise in the tonsillar mucus in scarlet fever in the early acute stage and had, in addition, applied the sugar tests as a means of classifying them into more or less definite groups, a great number of observations were made on the biochemical properties and reactions of the streptococci so readily isolated from scarlatinal sources.

The nett result of all these investigations seems to be that at the present time with the tests in vogue, it is not possible to distinguish between streptococci of scarlatinal origin and those isolated from non-scarlatinal sources.

This is the conclusion reached by Dr. Gordon after examining 155 streptococci from the throats of 50 cases of scarlet fever. I have obtained from a case of cellulitis in a boy who had not been in contact with scarlet fever, and who showed no signs of that disease, a streptococcus which was quite indistinguishable from some ten strains isolated from a variety of situations in scarlet fever patients, some being taken from the throat in the early acute stages and others

from various purulent discharges—and this is a common experience. Certain facts do stand out, I think, fairly definitely as a result of the research work that has been done, and they go far to show the importance of streptococcal infections in scarlet fever.

Briefly it seems that the following statements are justified:—

- (1.) Streptococci are the most abundant of known organisms present in the throat secretions in the early stages of scarlet fever.
- (2.) Severe uncomplicated cases of scarlet fever may die of a streptococcal septicaemia.
- (3.) Fatal cases of septic scarlet fever not infrequently die of a streptococcal septicaemia.
- (4.) Streptococci are very frequently present in the purulent discharges associated with the disease, and can generally be obtained from the kidneys post-mortem in cases dying of nephritis as a complication.

Reverting to the question of the difficulties of the scarlet fever problem, more especially as they appeal to those engaged in the treatment of the disease, it seems there is room for some further method which may be employed in the more severe and septic cases.

This raises the question of the curative power of the various anti-streptococcal sera obtainable at the present time.

Those prepared against streptococci non-scarlatinal in origin have proved disappointing, but, where the horses have been inoculated with scarlatinal streptococci, the resulting sera have been reported as being of considerable value in ameliorating the bad symptoms.

Their action is considered, by the clinicians who have used them, to be anti-toxic rather than bactericidal.

I have no first-hand knowledge of the action of these sera, and the facts I have briefly stated are mentioned by Dr. Gordon in the *Practitioner* for January, 1909, in an article on the bacteriology of scarlet fever, in which he describes the results and conclusions of those using Moser's Serum, Charlton's, and that of two Russian observers, Palmirski and Zebrowski.

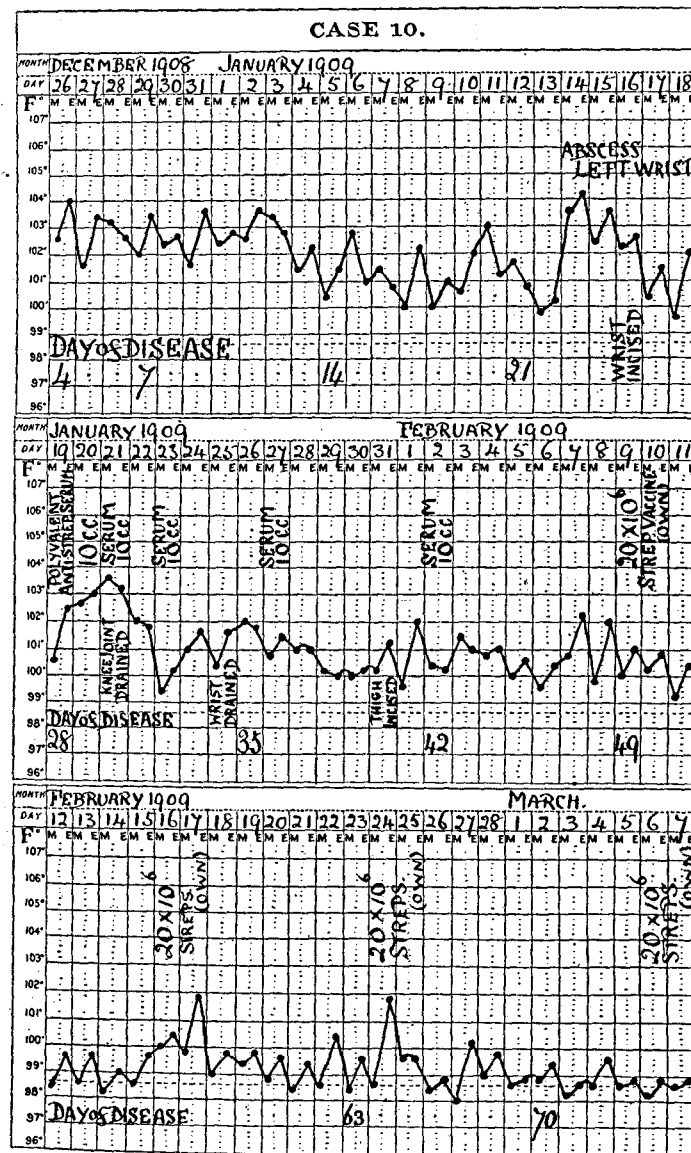
In the ordinary mild clean cases of scarlet fever, in which the temperature reaches normal on the fourth or fifth day of disease, little treatment is required, and certainly an anti-toxic serum does not appear to be necessary. In the more severe types, however, some specific treatment would be welcome.

The clinical picture of a case of septic scarlet fever is well known—the marked faucial swelling and oedema, post-nasal obstruction, profuse rhinorrhoea, great enlargement of the cervical

glands, and, later, in many cases the purulent ear discharge, do not require description in detail. It is in these cases that injections of streptococcal vaccines seem likely to be of benefit and for this reason—one not infrequently sees in hospital an ordinary mild attack of scarlet fever with the temperature falling and apparently about to reach normal on the fourth or fifth day of disease, undergo a change

otorrhœa developed pyæmic abscesses in the left wrist and right knee joint.

This patient made no attempt at improvement until treated with a vaccine prepared from a streptococcus isolated from the pus from the knee. Polyvalent anti-streptococcal serum had been tried without any permanent good effect, and the advisability of amputating the leg was becoming every day more apparent



V.H.—SEVERE SEPTIC SCARLET FEVER.

the worse and develop into a septic condition with characters I have mentioned above. In these cases seem to be scarlet fever plus something else being undoubtedly in some instances streptococcal infection, coming on locally in the throat and perhaps ending as a general blood infection.

V.H.—Aged five years, an extremely bad case of septic scarlet fever with profuse double

until this autogenous vaccine was injected. Improvement in the general and local conditions, was most marked after the first dose and the eventually made a very good recovery.

The outcome of this case was an attempt to prevent complications arising in a series of scarlet fever patients, by means of inoculation with a stock vaccine prepared from streptococci of scarlatinal origin. Recent work by I. Bra

and others on the opsonic index in scarlet fever patients as regards streptococci has shown that the index is below normal in the initial febrile stage, and that it rises above the normal as convalescence is established, reaching its highest level during the third week of illness.

The index is found, moreover, to fall below normal at the onset of Adenitis and Renal complications, and in fatal cases it is markedly low.

The presence of streptococcal antibodies in the blood of scarlet fever patients in the second week has also been demonstrated. In view of these facts and considering how a streptococcal infection is associated with the common complications of scarlet fever, from the attempt to raise the patients' resistance to such organisms by vaccine therapy the result is worth while. In this series of cases, in case numbers in the series being small (so far, 50 inoculated and 50 controls), I have found identical the mild clean type of scarlet fever, i.e., scarletina Simplex, the vaccine injections have while effect, if any, on the temperature in the distinct stage and the incidence rate of complications has been about the same in the observed and control cases. In my estimate, it is only the more severe types and have neptic variety that are benefited by the and inoculations, and in these I found by experience that giving the vaccine in the acute stages, combined treatment of the main illness had any attempt to prevent complications streptococcal. I have selected six cases from the in nor as being of special interest but before summarizing them shortly, a brief outline of the composition of the vaccine, the doses employed, spacing of doses and the site of injection is required. I have been using a stock vaccine made from three strains of streptococci isolated from scarlet fever patients. One of these strains I obtained from the heart's blood post-mortem in pure culture from a patient dead of septic scarlet fever on the seventh day of disease, and one from the pus of a cervical gland abscess, whilst the third was isolated from the purulent nasal discharge of a boy who had given rise to a "return" case.

These three strains were identical in their biochemical properties and had all the characters of a common form of streptococcus not being. None of them clotted milk nor showed any marked conglomeration in broth. The strong vaccine from these three strains ten strains prepared for me very kindly by Dr. in scarlet fever. It was sterilised by autolysis, the kept in this process in the hot incubator

at 37°C for ten days; 0.5 per cent. phenol was added as a preservative at the end of that time.

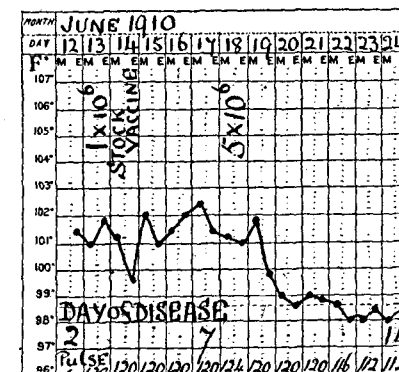
After suitable dilution with sterile normal saline, I put up the vaccine in 1 c.c. doses of various strengths in small ampoules. The initial dose given has been in most cases five or ten millions cocci and at intervals of three or four days I have given double the previous dose until the symptoms have abated and the temperature reached normal.

In general, the inoculations were started as soon as possible after the case had been admitted, irrespective of the day of disease.

All the injections were given between the scapulae subcutaneously after thorough swabbing of the skin with ether:

No opsonic determinations were carried out.

Of the six cases I have selected Nos. 1 and 2 were much alike. Their ages were two and a half years and two years five months. Each had an eruption of a very dusky purple character and an irregular temperature not settling to normal till after the seventh day of illness.



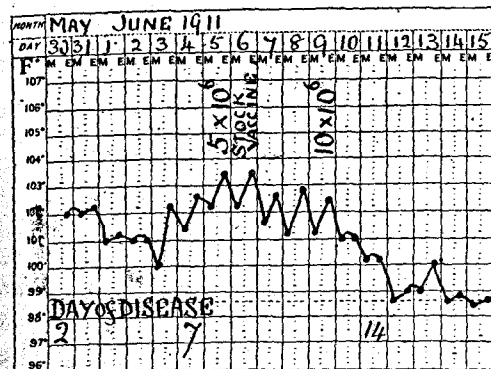
No. 1.—SEVERE SCARLATINA SIMPLEX.

No. 1 was given doses of 1 and 5 million cocci on the third and eighth day, and No. 2 had 5, 10 and 20 million on the third, seventh and twelfth day of disease respectively.

There is nothing very striking about the temperature charts but the improvement in the general condition subsequent to the injections was obvious, and in the case of No. 2, which had the throat syringed with chlorine water and the neck poulticed, the local faucial inflammation and adenitis subsided rapidly after the second dose. Neither had albumen in the urine and both made good recoveries, although No. 2 had a secondary tonsillitis on twenty-second day of disease; otherwise they were uncomplicated.

These cases were not of the septic variety but were examples of severe Scarlatina Simplex with dusky staining eruption. The children were obviously ill, taking nourishment badly

and appeared on admission to be cases of a nature which do not as a rule do well. My impression at the time was that, in each case, the inoculations helped to cut short the illness.



No. 3.—SCARLET FEVER.

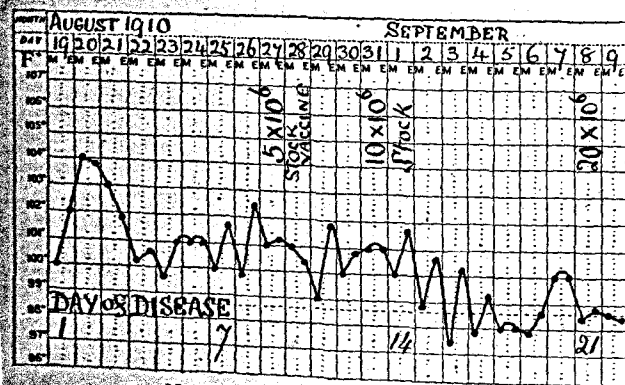
The chart of case No. 3 shows a rise of temperature to a higher level on the sixth day of illness and this was coincident with an increase in the angina.

There was no rhinorrhœa and the condition did not merit the term septic, but there was marked faucial swelling and injection with deposit on the tonsils and much cervical gland swelling.

The eruption was still vivid on the sixth day and very coarse and blotchy on the limbs.

In this case the vaccine seemed to lower the temperature and materially assist the local treatment in clearing up the faucial inflammation and adenitis.

The child was aged 3 years, and made a good recovery. There were no complications.



No. 4.—SEPTIC SCARLET FEVER.

The remaining three cases are examples of septic scarlet fever. No. 4, aged 2½ years, on the fourth day of illness seemed to be getting the better of her infection, but gradually from that day developed the typical clinical picture of septic scarlet fever.

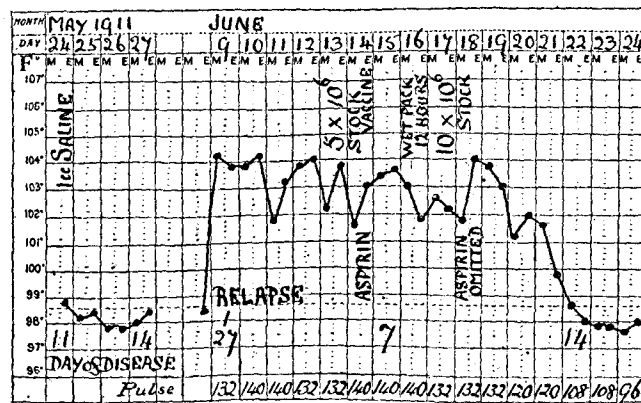
On the ninth day of disease she was obviously very ill. Improvement set in shortly

after the first dose of vaccine was given, the gland swelling and rhinorrhœa subsiding soon after the second dose, viz.: 20 millions on thirteenth day. Right ear discharge appeared on the twenty-second day but ceased fifteen days later and did not return during the following three weeks during which the patient remained in hospital.

This child was dangerously ill and of an age at which septic scarlet fever not infrequently produces a fatal result. I believe that the vaccine injections were largely responsible for the cutting short of the septic process and that they materially aided her to make a good recovery. The early cessation of the rhinorrhœa and short duration of the otorrhœa were interesting features of the case.

Case No. 5, aged 3½ years, was really one of the control cases in my series vaccinated to prevent complications, and had been given 1 c.c. sterile normal saline subcutaneously to distinguish it as a control case.

She was admitted to hospital on eleventh day of disease with a peeled tongue and desquamation on the hands. On the twenty-seventh day she started a genuine relapse, desquamation being general at that time. She had high irregular temperature and was very septic on the fifth day of her relapse and although really a control case, she was so ill that I felt obliged to give her some vaccine on account of the favourable impression I had obtained as to its efficacy in similar bad cases. The chart shows an interesting fall in



No. 5.—SEPTIC SCARLET FEVER.

temperature after the second dose. Aspirin was given for slight rheumatism of the wrists and one day she was in a wet pack for twelve hours. Complete re-desquamation occurred.

It was noticeable that:—

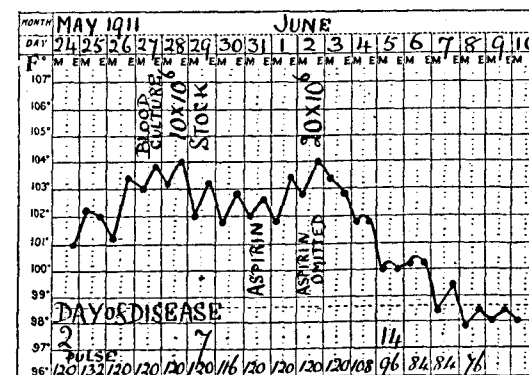
1. There were no ear complications.
2. The urine was clear of albumen throughout
3. The rhinorrhœa ceased early.

No. 6 was a boy, aged 9 years, who had a severe septic attack. A rise of temperature on the 4th day of illness to a higher level coincided with an increase in the severity of the symptoms. There was much œdema of the fauces with deposit on the tonsils and marked naso-pharyngeal obstruction.

Blood culture on the 5th day of disease proved negative.

On the 6th day much cervical gland swelling and profuse rhinorrhœa were in evidence and altogether he presented the complete picture of septic scarlet fever.

After a dose of 10 million cocci on this day, gradual improvement set in, both in the local and general condition, the temperature slowly coming down to a lower level in the next three days. Aspirin grains V 6 hourly for rheumatism in the wrists was given, starting on the 9th day and omitted on the 11th day of disease. Following on a dose of 20 millions on this 11th day of illness, the temperature gradually fell to normal, the whole septic process coming to an end.



No. 6.—SEPTIC SCARLET FEVER.

In this case I feel convinced that the inoculations largely helped to bring about the satisfactory termination to the illness. There were no ear complications, the urine was free from albumen throughout and the rhinorrhœa cleared up very quickly.

This case and that of V.H., the temperature charts of which I showed first, demonstrate, I think, that streptococcal vaccines are of definite value in certain cases of scarlet fever. In the case of V.H. it is true I was using her own organism which is the ideal method but unfortunately not always practicable. The failure of all previous treatment to stop the septic process only served to show up more favourably the efficacy of vaccine treatment.

She had a profoundly septic attack with much constitutional disturbance, considerable

sloughing of the fauces and pyæmic abscesses; altogether, it was most striking how rapidly the whole process came to an end as soon as the inoculations were commenced.

I have used this stock vaccine in some 16 cases of ear discharge complicating scarlet fever and the results have been distinctly encouraging.

Here again the ideal method would be to make special autogenous vaccines for each patient, as was done in some cases reported by Dr. Nankivell, of Croydon, in the Society's Journal for June, 1911, but, so many of them in my experience contain in the discharge, if not a pure growth of streptococci—a mixture of organisms in which streptococci predominate when the discharge first appears, that, it is worth while to start with a stock streptococcal vaccine, whilst a special vaccine is being prepared, if it is considered necessary. One can hardly doubt that the purulent discharges in scarlet fever patients contain in many cases the virus of the disease. If vaccine therapy will cure or help to cure these discharges and by raising the patient's resistance to the organisms contained therein, minimise the chance of the recurrence of the discharge, this method of treatment should assist in lowering the percentage of "return" cases, inasmuch as 50 per cent. of the primary cases have some purulent discharge at the time they infect the "return" case.

I believe that these discharges can be cured by this means.

In the course of this vaccination treatment I have noticed a curious local skin re-action in some cases which takes place around the site of injection of the vaccine. It consists of an area of local redness, swelling and tenderness of about 1½ to 2 inches diameter, and appears within 24 hours of injection, being most pronounced at the end of that period, and subsiding in the following 24 hours. The redness of the skin occurs as a simple erythematous blush which fades on pressure.

The dose necessary to produce this reaction has been 100 millions streptococci and in 12 cases receiving this dose of stock vaccine exactly similar results were obtained. Doses of 50 millions did not cause its appearance.

The same reaction occurred when I used a vaccine made from a streptococcus indistinguishable from streptococcus pyogenes which I had isolated from the throat in an acute case of scarlet fever. This latter vaccine contained no phenol.

Similar results were obtained in two cases of simple tonsillitis and in two cases of scarlet fever. I produced the same reaction when I used 100 millions of a streptococcus pyogenes vaccine. A similar reaction has been reported by Russian observers when using a streptococcus vaccine as a preventive of scarlet fever in the case of normal children.

I do not know if any significance can be attached to these facts but, if worked out in a number of cases, the reaction might perhaps lend support to the view that the streptococci in the scarlatinal throat are not different to common non-scarlatinal streptococci.

It is interesting that this local reaction does not occur until a dose of 100 millions is given, and that no rise of temperature or general reaction accompanies it. I found also that the absence of previous complications in no way affected the production of the reaction.

In work of this nature, where one is dealing with a small number of cases, it is not possible to give definite conclusions.

One can only give one's impressions and the results of vaccination in scarlet fever with stock streptococcal vaccine, as I have used it, appear to point to the probable truth of the following statement:—

The treatment is:

1. Of little effect in the case of *Scarlatina Simplex*.
2. Of benefit in the more severe cases of *Scarlatina*.
3. Of definite value in septic cases as shown by:—
 - (a) Improvement in the general condition.
 - (b) A lowering of temperature.
 - (c) The early cessation of the rhinorrhœa.
 - (d) The cutting short of the septic process.

In conclusion, I wish to express my sincere thanks to Dr. Stewart, medical superintendent of the hospital for permission to publish details of the above cases and for much kindly criticism.

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DR. T. H. JONES, county medical officer of health for Surrey, in his annual report, states that in one district not one-half of the children are protected against smallpox by vaccination.

SOME OBSERVATIONS OF TEMPERATURE IN ELEMENTARY SCHOOL CHILDREN.*

By FRED. E. WYNNE, M.B., D.P.H.,
Medical Officer of Health, Wigan.

I MUST, in the first place, apologise for bringing before this Society the results of observations which are still very far from complete. My object in recording the result of these experiments as far as they have gone, is to obtain the advice and suggestions of members as to further lines of investigation which may be pursued in the future, and perhaps the co-operation of colleagues in other parts of the country.

I am fully conscious of the fallacies which lurk in deductions made from insufficient data, but I hope that the tabulated results of 1,000 temperature observations may prove at least suggestive, and provide material worthy at all events of being tested by future experience. Unfortunately I have not all the particulars even in these 1,000 cases that for my present purpose I should like to possess. The reason for this is that at the outset of this enquiry it was undertaken for a specific purpose, and it did not then seem necessary to record all particulars, except in cases where the temperature was markedly above or below the so-called normal. I am thus, for instance, unable from the present series of cases to compare the frequency of abnormal temperatures in various age-periods and in certain other respects.

The prevention of measles in elementary schools is, I think, one of the most serious problems with which the medical officer of health and the school medical officer is faced, both with a view to the lowering of the lamentable mortality from this cause, and of preventing the very serious loss of grant to the school authority for which it is responsible. The results of school-closure, except in very exceptional cases, is, I think, admittedly unsatisfactory, mainly owing to the fact that all possibility of supervision of the children is lost, and they are left free to infect their families and playmates. Unfortunately the industrial classes are still imbued with the fallacy that measles is a trivial complaint, and deliberately expose their healthy children to infection, in order that the whole family may "get it over together." When the school is closed we accordingly lose our only chance of receiving early notifications of the disease, and

the services of school nurses and health visitors in preventing this deliberate dissemination perforce comes to an end. Somewhat better results attend the process of rigid inspection and systematic exclusion of individuals. But, unfortunately, in most cases the child has been infectious for some days before the symptoms can be distinguished from those of a common cold.

The problem, therefore, resolves itself into one of early diagnosis.

It was while I was endeavouring to discover some means of making a diagnosis in the pre-infectious stage of the disease, that my attention was called to the result of a very interesting experiment that had been for some time in progress at a large private boarding-school in the South of England. About two years ago you will remember that in several public schools, including the Naval College at Osborne, and in many of the large private boarding-schools of the South of England, there were very serious outbreaks of measles, among the victims being the Prince of Wales and his brother. In many cases the schools were closed and the pupils returned to their homes. One large college for girls was almost alone in its avoidance of an epidemic. This result was due to the system which had for some years been adopted by the principal of having the girls' temperatures regularly taken for three weeks after their return from the holidays, the period of three weeks being chosen so as to cover the incubation period of mumps. In every case in which any rise of temperature was noted the pupil was immediately isolated, until all danger of any infectious condition supervening was removed. By this means, while several cases of infectious diseases occurred among the pupils, in no single case was it communicated to another, because the patient was isolated in the pre-infectious stage, the only danger signal being the initial rise of temperature. It was, of course, no part of this lady's object to obtain any statistical record, so that complete figures dealing with the experiment are unavailable, but she has very kindly supplied me with the following information: "For the past six years we have taken the temperatures of all pupils at 6.30 a.m., before they are allowed to get up, during the first 21 days of each term, and at 6 p.m. we take the temperatures of all those who share rooms with other girls. Any case showing the slightest rise of temperature is isolated and watched, and the process has saved the school

from epidemics, and over and over again has enabled us to isolate an infectious case early enough to prevent its spread. Measles is invariably heralded by a slight rise to 99° or a little over for from 24 hours to three or four days before any symptoms appear or the patient begins to feel poorly. If isolated at that stage you can effectually prevent its spread. We have found that measles is invariably preceded by this slight rise; other complaints, e.g. German measles, chicken-pox, mumps, etc., not always, but generally. There are, of course, many cases in which no result follows the slight rise of temperature, but in these it is usually down again in an hour or two. When it is the beginning of an illness the abnormal temperature is usually steadily maintained." As to numbers, this school has 364 girls at present, and the numbers have been over 300 for six years. These results are confirmed by this temperature chart which I have with me, and which appears to me to be very interesting and instructive. In this case a number of boys on returning to school had tea in the same room, and were in each others' company for 20 minutes, when one of them was found to be suffering from measles. This child was at once isolated and all the contacts were forthwith sent home. In the case of the subject of this chart, it fortunately occurred to his parents to take a continuous record of his morning and evening temperature, commencing some days before the expiration of the incubation period, so that we have the unusual advantage of having the exact date of infection fixed, namely the afternoon of January 25th, 1911. Observations of the temperature were commenced on February 4th, that is, on the tenth day. The temperature remained normal until the evening of February 7th, the thirteenth day, when it rose to 100°, the patient being otherwise apparently quite well, and from that period 4-hourly observations were maintained. On the following, or the fourteenth day, it remained up, rising to 102 in the evening, and this was followed by a very remarkable drop to below normal on the morning of the fifteenth day, this being succeeded by an immediate rise to 101 at noon and 102.5 in the evening. From this point the temperature remained between 102 and 104 until the middle of the seventeenth day, when the rash was fully developed, after which there was the rapid and uneventful decline to normal with which we are familiar in uncomplicated cases. So complete a record as this is unusual and difficult to obtain, and I regret that hitherto

* Read at a Meeting of the Society of Medical Officers of Health, December 13th, 1912.

I have had no opportunity of obtaining similar observations with which to compare it. We are not justified in assuming that in every case the initial rise is followed by even a brief period of defervescence such as occurred in this instance, but taken in conjunction with the experiences referred to above, I think this chart strongly suggests that the initial rise of the period of onset corresponds also to a pre-infectious state, during which the patient may be successfully isolated. In any case I think valuable results might accrue if medical men or others attached to institutions in which they

leave the elementary schools just at the age when they are entering the schools of the well-to-do, and their physique cannot be compared with that of the well nurtured and carefully tended children of the comfortable classes. One would not, therefore, expect to find among these children so close an adherence to the recognised mean temperature as prevails among the pupils in the better-class schools. I was not, however, prepared to find, as I did, that more than 25 per cent. of all the children examined who were supposed to be in ordinary health, had temperatures of 99° or over, while

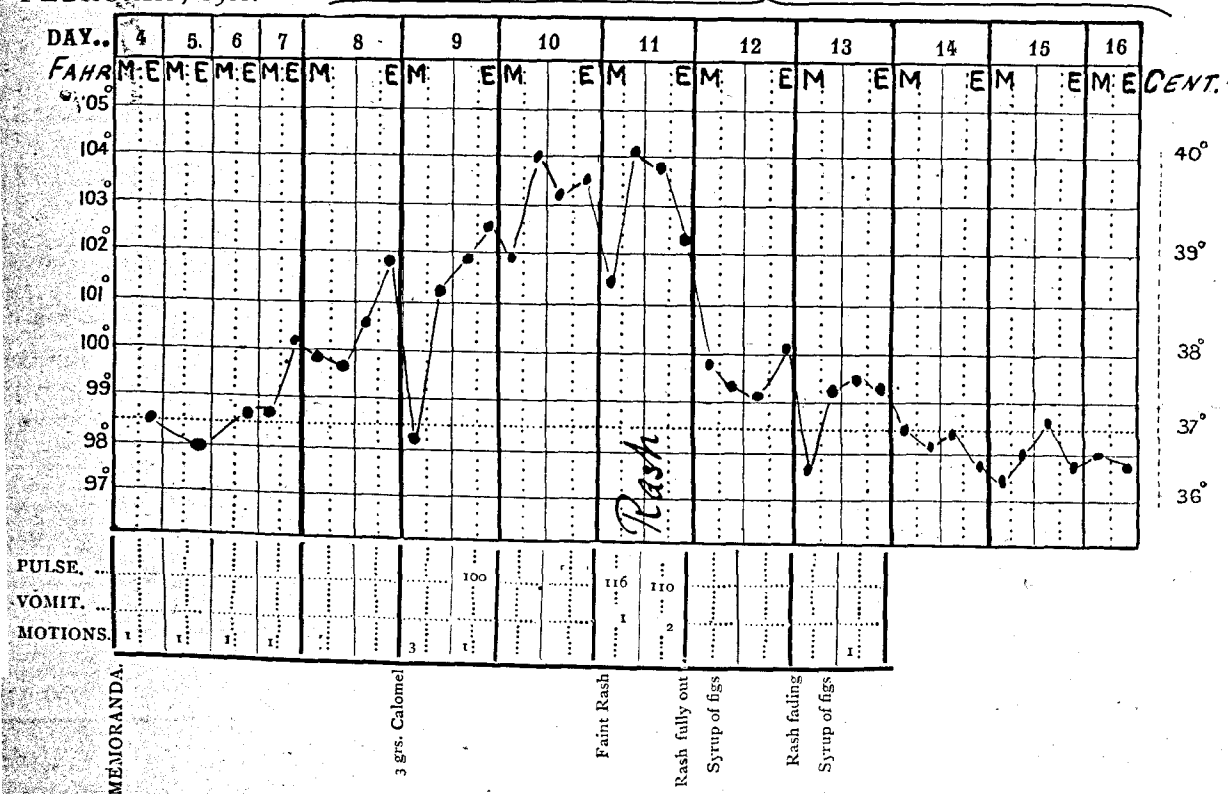
NAME: E.E.W.

DISEASE: Measles.

Exposed to infection for 20 minutes, on January 25th, 1911.

FEBRUARY, 1911.

Records taken daily at 8.30 a.m., 10.30 a.m., 4.30 p.m., 8.30 p.m.



have opportunities of ascertaining accurately the date of infection would take continuous records during and after the period of incubation. I hoped that it might be possible to obtain some results by applying this method in the elementary schools, and began to take the temperatures of children in affected schools with no other idea in view. But it soon became apparent that the method was not applicable. For one thing, it would be impossible to obtain the evening temperatures of large numbers of children without a large staff of angels as school-nurses. Besides, children

a considerable number had temperatures of more than one degree below the usual normal. It was obviously impossible to exclude so large a number of children, and further observations showed that in the great majority of cases the temperature very soon returned to normal, while very few cases of infectious disease were discovered. The results, however, showed such an amount of instability in the temperature level of children of this class as to justify further investigation. I can only regret, as I said, that so many observations were taken before I contemplated this wider object, so that

I am unable to include many interesting particulars in an analysis of the present series of cases.

Of the 1,000 children examined 531 were girls and 469 boys. I have taken the range from 97.4 to 99° as representing a normal temperature in children, and find that the cases examined may be tabulated thus:—

Below Normal.	Normal.	Above Normal.
82	343	261
or	or	or
8.2 per cent.	34.3 per cent.	26.1 per cent.

I will dispose at once of the result of these observations on the prevention of infectious disease. Of the 261 children with temperatures above normal only six developed measles. Of these three developed the disease on the sixteenth day and one on the tenth day, so that the association of the raised temperature with the subsequent appearance of the disease can hardly be supposed to be more than accidental. Three developed scarlet fever, one on the second day and one on the third day. The exclusion of these two children may have had a valuable influence in preventing the further spread of the disease. The third child had suspicious symptoms when examined, and subsequently peeled. One child developed mumps on the second day and one chicken-pox on the third day. From the point of view of preventive medicine I fear this cannot be regarded as other than a poor harvest for the work involved.

But there is another point of great importance, and that is the relation of these supernormal temperatures to tuberculosis. Of the 261 children with temperatures of 99° or over, 112 were found to have no obvious defect, which is the more remarkable as 70 per cent. of the children examined during the same period in the way of routine inspection were suffering from some form of physical defect. But of these 112 febrile children 72 were subjected to Von Pirquet's test, and of these no less than 57, or 79 per cent., gave a positive reaction. I am aware that these numbers are too small to base any very definite conclusion upon them. But these were all apparently healthy children, showing no evidence at all of tuberculosis, and in whom the existence of the disease would certainly not have been suspected without the tuberculin test. In the work of discovering early cases of tuberculosis among elementary school-children, I think considerable weight should attach to the occurrence of even transitory rises of temperature, and temperature observations would be a useful method of sorting out cases for the application of the

more troublesome methods of tuberculin diagnosis. Of the other physical defects associated with raised temperatures, the commonest was defective teeth, which were present in 131 cases, generally in combination with other defects, especially with nasal catarrh, which was present in 56 cases. The tonsils were enlarged in 18 cases, 16 of these being associated with bad teeth and two with adenoids. Adenoids were present altogether in 11 cases, of which six were associated with bad teeth and seven with nasal catarrh. Glands were enlarged in 11 cases, of which 10 also had bad teeth. The constant association of defective teeth with enlarged tonsils and adenoids is too well known to require further comment, but it is interesting to find this tendency to elevation of temperature completing the quartette of symptoms. Three of these children were suffering from persistent otorrhœa, and six had more or less severe coughs without obvious signs of phthisis, but the tuberculin test was not applied in these cases.

With regard to the duration of the pyrexia in these cases, we found that the temperature had returned to normal on the second day in 179, or 68.59 per cent.

Still above normal on 2nd day in 82, or 31.4 per cent.

" " " 3rd " 55, or 21.0 "

" " " 4th " 31, or 11.8 "

" " " 5th " 16, or 6.1 "

Those cases in which pyrexia lasted longer than the fifth day were all associated with more or less serious defect or definite illness. Twenty-seven cases were discovered in which there was a definite tendency to recurrent rises of temperature with normal intervals, and in which nothing was found satisfactorily to account for the condition.

A very remarkable difference between the sexes appears from these figures, girls showing a markedly greater tendency to these fluctuations of temperature than boys. Of the girls examined 28.55 per cent. had temperatures above 99, as against 23.24 per cent. of the boys, while 10 per cent. of the girls and 6.18 per cent. of the boys had temperatures below 97.4°. These results were so constant in every school and in every district in which observations were taken that I cannot but believe that the results will be confirmed by future investigations, and that perhaps increased excursions from the temperature base-line will be added to the list of secondary sexual characteristics, at all events as regards the growing female.

In considering these results we have to take into consideration what are usually regarded

as the normal variations of temperature, and of these the most important is the diurnal variation. This can hardly constitute a source of error, and, on the other hand, my observations can throw no light on the subject because all temperatures were taken in the first instance during school hours, and subsequent observations, if made at the children's homes, were made in the forenoon, and according to Jürgensen's investigations, which, though old, have not I think been disputed, the rise towards the maximum does not commence until after 4 p.m. In any case, a comparison between the temperatures taken during the morning and afternoon sessions of school reveals no difference in the series of cases under consideration. The alleged normal rise of temperature immediately after meals was obviously a matter which it was impossible to investigate under the circumstances. It has frequently been asserted that muscular exercise raises the temperature, but observations on this point give somewhat discordant results. Most of these observations have been made on adults, and it is natural that the results should be discrepant. Increased muscular exertion must necessarily result in an increased liberation of heat, and any alteration in the body temperature will depend on the ratio between this increased liberation of heat and the capacity of the individual for dissipating it. Thus we would expect a person who sweats excessively on slight exertion to have his temperature lowered rather than raised by exercise. Up to the present I have only been able to test this matter in school children in a few instances.

The temperatures of 80 children have been taken before and after a quarter of an hour's play, during which they underwent fairly violent exertion in the way of running, jumping, etc. The results may be tabulated as follows:

	Boys.	Girls.
Temperatures raised by exercise ..	12	28.
Temperatures lowered by exercise ..	14	20
No change ..	0	6

I think these observations, imperfect as they are, go to prove that there exists among the elementary school children, at all events in industrial districts, a tendency to more frequent departure from the accepted mean temperature than is generally recognised. The question that requires further investigation is what should be regarded as the normal range of temperature in healthy children, or what constitutes a true departure from the normal? In dealing with children of the industrial classes one difficulty is to find material for

control experiments, because so few are free from some defect.

In considering the question of body temperature generally we have to bear in mind the fact that the human species, with all its remarkable powers of temperature regulation, is only one stage in the advance from the *poikilo-thermous amphibian* to the ideal organism whose temperature should remain as constant under all conditions as though governed by a perfect thermostat. We are all familiar with the fact that the normal temperature of the infant is higher than that of the adult, and the frequency of its pulse and respiration is greater. We are so familiar with these associated phenomena that we are apt to forget to ask ourselves why they should be so associated? I think the answer is quite simple. It is because the bulk of the child is less than that of the adult. The temperature of the body is a ratio between its heat-generating and its heat-dissipating powers. Roughly speaking, we may say that its heat-generating powers are proportionate to its cubic capacity, and its heat-dissipating powers to its surface area, since it has been estimated that 77 per cent. of the heat of the body is lost by radiation and evaporation from the skin. Now it is obvious that as an animal grows its cubic capacity increases in a greater ratio than does its superficies: the one is a geometrical, the other an arithmetical ratio. The smaller the animal, therefore, the greater must be the activity of the katabolic processes which are the source of its heat, so that its comparative excess of heat-losing surface may be compensated. In the case of the infant it would seem that the tendency is to over-compensation, and we get accordingly a higher temperature than we do in the adult. As the bulk of the child increases, and its nervous control develops, we get a gradual approximation to temperature equilibrium, but the date of attainment of this equilibrium will vary in different individuals. It is reasonable, therefore, to expect, even in perfectly healthy children, a wider oscillation from the mean than we find in the adult. But the problem is complicated by the intrusion of abnormal factors, represented by the various pathological conditions which are unfortunately so much more the rule than the exception among the class of children under consideration.

I believe there is ample scope for further investigation into this matter on the lines I have indicated, and incidentally much good might result by the taking of continuous temperature records in institutions where children

are resident, as a means of preventing epidemics, but the method is not practically applicable to elementary day-schools, although in the latter it is likely to prove of material assistance in the detection of early cases of tuberculosis.

In conclusion, I wish to thank my colleagues, Dr. F. Hall, assistant school medical officer for Derby, and Dr. Cecil Berry, assistant medical officer for Wigan, for much kind assistance and many valuable suggestions in carrying out the admittedly very imperfect experiments which form the subject of this communication.

DISCUSSION.

THE PRESIDENT said that Dr. Wynne's paper was an exceedingly interesting one. The subject was not one which would attract everybody, and the fact that it had attracted Dr. Wynne was fortunate. The most practical aspect of the investigation from their point of view as medical officers of health, was that in connection with the prevention of measles. That disease had many peculiarities which made it, perhaps, one of the most difficult of all forms of infectious sickness to combat; and if any light at all could be thrown upon what might be called premonitory symptoms in very early diagnosis, it would be extremely helpful. No doubt there were institutions in which continuous observations of temperatures would be practicable; but in most, especially those occupied by children of the poorer classes, the inmates had already suffered from this form of disease, and were practically immune. But amongst the better classes with better protected children, that did not appear to be the case. Those interesting occurrences at Osborne to which Dr. Wynne called attention were an illustration of that. The subject of thermometry was extremely fascinating and in past times had thrown an enormous deal of light on infectious disease, its natural history, so to speak, its progress and development. Many a time an obscure diagnosis had been cleared up by those symptoms alone. In Wunderlich's very interesting book on Medical Thermometry, an article on Relapses in Typhoid, by the late Dr. Irvine, showed what the regular application of the thermometer brought about. Dr. Wynne's results were interesting so far as they went; but as he suggested, a far more extended investigation on the same lines would probably result in even more useful information being obtained. The main thing that he gathered from Dr. Wynne's paper was that in the event of pyrexia continuing for several days in an apparently otherwise healthy child, it implied and was almost invariably associated with some illness of a definite character; the casual rises and falls were of relatively small consequence. The routine practice of taking the temperature and the pulse of the pupils for fifteen days after their admission

to the institution referred to by Dr. Wynne, did result definitely in keeping that school free from infection, or, at any rate, it was followed by freedom from infection. Of course all these things pointed a way to what could be done under certain circumstances, and although unfortunately it might not be possible to adopt any means of that kind amongst the poorer classes, where infection was so rife, it would do a great deal of good in other directions.

DR. HERBERT JONES said that this was pre-eminently a paper such as the Society ought to welcome. It was just of that type for the study of which the Society was established. They all admitted that the greatest difficulty in their work in dealing with outbreaks of measles was that they could not foresee when a child was likely to have the disease. Any suggestion that could indicate whether a child was sickening ought to be of service. The line of investigation which Dr. Wynne had started should induce others to carry on observations, the result of which they only could appreciate.

DR. CLEMENTS said he had frequently found the presence of Koplik spots on the buccal mucosa of great assistance in the early diagnosis of measles, especially if associated with a slight rise in temperature. They were often present one to five days before the rash appeared, and when found a diagnosis of measles could be made with certainty. If isolation were adopted at this early stage it would limit and sometimes prevent the spread of the disease to other children. His observations were based on his experience of outbreaks of measles in institutions, and he considered that this early sign of measles, which was always to be found before the rash appeared, might be used with advantage in school epidemics to secure earlier isolation.

DRS. J. TUBB-THOMAS, A. H. BYGOTT and FAIRFIELD THOMAS also took part in the discussion.

DR. WYNNE, in replying on the discussion, said he was extremely obliged for the kind reception which had been given to his paper. He came there extremely conscious of its inadequacy and of the vague results which he had to put before them; but he knew that it was better to come even with vague results than to attempt to manufacture them. The President had referred to the fact that most institutions for the poorer classes contained children already protected from measles by having suffered from the disease. That was in the main true; but in some Poor Law institutions and cottage homes they did get very serious outbreaks of measles, and in cases like that, where an epidemic was threatened, this method of diagnosis was valuable. His experience was that where the pyrexia continued for more than five days, in every case there was some disease concurrent or developed. He was very gratified to hear

that Dr. Tubb-Thomas was going to apply the method in the two boys' schools with which he was associated. That gentleman had referred to the feature of the rise of temperature after severe exertion. He (Dr. Wynne) knew that that was one of the canons of physiology; but he must confess that he was very sceptical about it. He was making some control experiments with adults. Through the courtesy of the Wigan Football Club he had gone into the pavilion both before and after a football match and had taken the temperature of the professional players. He had not yet sufficient observations from which to base absolute conclusions; but they were most remarkable, because he found the temperature in not a few of the players was lower at the end of the match than before it. He had found temperatures as high as 101 immediately before the match, probably due to some extent to excitement, and a lower temperature at the close, probably due to fatigue and the fact that the excitement was past. The temperatures were taken with carefully equated thermometers. Reference had been made to Von Pirquet reactions. He quite agreed as to the uncertainty of the test, but had time been taken to go on with the diagnostic injection of tuberculin the result might have been different, and the number of positive reactions in children would probably have been found to be greater than even 79 per cent., which was extraordinarily high. He was much obliged to Dr. Herbert Jones for his kindly remarks. Dr. Clements had referred to the presence of Koplik spots. It was very important that those should be looked for, but the temperature in the mouth should also be taken. He had not himself found Koplik's spots in as early a stage as Dr. Clements.

COUNTY OF AYR.—MEDICAL INSPECTION OF SCHOOLS.—In Ayrshire the work of inspection is carried out by three medical inspectors, who between them examined over 21,000 children. This number is made up of infants, intermediates (children about nine years of age), leavers, non-routine cases, and cases re-examined. The intermediate class was added for the first time in 1911. Amongst the children examined a number suffering from pulmonary tuberculosis were discovered, and removed to the Ayrshire Sanatorium. The percentage of scholars found to be in a dirty and verminous condition, though lower than in the previous year, was still high; and it is pointed out that if the visits of the inspector were more in the nature of a surprise results probably much worse than those reported would be obtained. Dr. MacDonald is anxious to see more use made of the school-nurse, and in his introductory letter suggests that possibly assistance to this end could be obtained from the various nursing associations in the county.

REPORT OF THE LOCAL GOVERNMENT BOARD FOR 1911-12.

THE portion of the report of the Local Government Board which contains a summary of the work done in relation to public health appeared most conveniently, almost simultaneously, with the report of the Board's medical officer. Both reports deserve and should receive careful consideration from medical officers of health, if not from all concerned or interested in public health work.

The views of the Board on the question of Housing, which is considered first, seem to be more or less optimistic. The local authorities who are not making active progress are apparently in the minority, the part of the work neglected being chiefly that under Part III. of the 1890 Act, viz., the provision of new houses. Rural districts are only, apparently, gradually grasping the fact that adoption of this part of the Act is not now necessary, but it is hoped that the example set by the few councils who have taken advantage of their powers will be followed by others.

Under Part I., improvement schemes by the London County Council and the Councils of Exeter and Portsmouth, each involving considerable sums of money, are referred to. Two instances in which the Board had to interfere in order to induce local authorities to give attention to representations from their medical officers of health are mentioned.

The proceedings of local authorities under Part II. of the Act are very fully considered, and it is shown that there has been a great increase in the numbers of those who took action in regard to houses unfit for human habitation. In the report of the previous year the figure given was 474, or less than 26 per cent. of the total; in this the numbers have practically doubled—850, or about 46 per cent. The number of representations to local authorities totalled nearly 25,000, the difference as compared with 1909-10 being an increase of 18,000.

Sections 17 and 18 of the Housing, Town Planning, etc., Act, 1909, were those chiefly used, but the Board believe Sections 14 and 15 also to be useful. The total number of houses dealt with under them was 18,927, of which 6,767 were situated in rural districts. Out of 1,840 local authorities, only 500 took action under the sections, the majority being satisfied to proceed under other powers.

Appeals against closing and other orders seem, from the figures given by the Board, to

have been less popular than in the period immediately succeeding the coming of the Act into force. The number received during the period under consideration was 132, the number remaining over from 1910 being 16. Of the 148, 88 were withdrawn and 25 dismissed, figures which seem to indicate that the number of orders made in doubtful cases must be exceedingly small.

Reference is made to a number of cases in which complaint was made of failure on the part of local authorities to exercise their powers under Part III. of the Act of 1890. In all of these action was taken by the Board and pressure brought to bear upon such councils as were in default.

The making of town planning schemes was authorized in 14 cases; in 24 others the Board obtained information indicating that schemes were in preparation or in contemplation.

In the section on Infectious Diseases a considerable amount of space is given to the consideration of phthisis. Reference is made to the fact that in St. Helens power has been obtained whereby the medical officer of health may apply to a court of summary jurisdiction for an order for the removal to and detention in a hospital of persons suffering from pulmonary tuberculosis.

A summary of replies from sanitary authorities, indicating that 1,500 beds had been provided in sanatoria and hospitals, is also given. Beds in private sanatoria had been subsidised or contracted for by 57 authorities and dispensaries provided by 30 more. The effect of the Insurance Act, 1911, on the question of tuberculosis is shortly referred to, and the fact that a committee on tuberculosis had been formed and had made a report, with the terms of which the Board agree, is noted.

With regard to other diseases, a certain amount of statistical and other information is given, notably as to ophthalmia neonatorum, as to which it is stated that in 1910, 56, and in 1911, 63 local authorities had included this disease in the list of those notifiable to the medical officer of health. The number of cases notified in 1911 was 799—438 in Manchester and 238 in Stoke-on-Trent. In London 575 cases were notified.

The only other portion of the report which need be referred to at any length is that relating to food supply. Interesting summaries are given of the work done in connection with the inspection of meat and food generally, the milk supply and The Sale of Food and Drugs Acts.

Copious extracts are made from the reports of medical officers of health and others dealing with special points and difficulties encountered in the administration of statutes, regulations, etc. Many of these have been made the subject of comment already in various journals, but it may be noted as a hopeful sign that prominence is given in the report to such matters as private slaughter-houses, the experiments of the Birmingham Corporation on the elimination of tuberculosis from herds of dairy cows, dirty milk, the importance of informal sampling, the inadequacy of fines inflicted by magistrates in cases of serious adulteration, toning of milk and so on.

Under the headings of water supplies, scavenging, sewerage and sewage disposal, it is practically stated that nothing worthy of special note occurred during the period under review. It may be mentioned, however, that the Board find that the practice of disposing of refuse in destructors is on the increase, the number of districts providing such appliances having increased from 20 in 1888 to 200 at present. It is pointed out with regard to this also that whereas, at first, destructors were only found in large towns, now quite a number have been constructed in districts of comparatively small population.

The Notification of Births Act, under the heading Adoptive Acts, it is shown has now been adopted for or put in force in 312 areas. The Board is satisfied from the reports of medical officers of health, who have had experience of its operation, that the Act "has led to a better knowledge and wider adoption of proper rules in regard to infant and child hygiene." The information with regard to this Act is given under the heading Local Administration. Here also is to be found a note as to confirmation of bye-laws and regulations, and as to the work done under the Canal Boats and other Acts.

In the appendices, in addition to tables dealing with sampling under The Sale of Food and Drugs Acts and so on, copies of special reports and of memoranda, circular letters and orders issued by the Board during the year are also given.

In the space at our disposal it is, of course, impossible to refer to more than a small part of the contents of such a report. Enough has been said, however, to show that the statement made at the commencement of this review, that the report deserves consideration from all interested in public health work, is correct.

THE INSTITUTIONAL TREATMENT OF TUBERCULOSIS.

THE circular letter which the Local Government Board have addressed to the Councils of Counties and County Boroughs, and which is dated the 6th December, 1912, relates to the institutional treatment of tuberculosis in all classes of the population. On the 14th May the Board had addressed a letter to County Councils, Councils of Boroughs, and Urban and District Councils on the subject of the Parliamentary Grant for Sanatorium Purposes in which reference was made to the report of the Departmental Committee on Tuberculosis, and the Councils of Counties and County Boroughs were invited, after conference and consultation with the other Councils, to determine what action they would take. It was recommended by the Board that for the prevention, detection and treatment of the disease, two units of administration should be established, "linked up to the general public health and medical work now carried on and working in harmony with the general practitioners." The first of these units was to be the tuberculosis dispensary, the second, institutions in which in-patient treatment is given.

The letter of the 6th December advises that the Insurance Committees should extend sanatorium benefit in so far as institutional treatment is concerned to the dependants of insured persons, and should arrange, subject to the consent of the Insurance Commissioners, to pay over to the Local Authorities the sums available for institutional treatment, the latter being responsible for such treatment of all classes whether insured or dependants of the insured or non-insured. For the purposes of the provision of institutions which would then devolve on Local Authorities the Board refer to their previous letter in which they stated that they propose to adopt the financial recommendations made by the Departmental Committee in regard to the distribution of the capital grant, *i.e.*, to provide three-fifths of the outlay on sanatoria and four-fifths of the outlay on dispensaries out of this fund.

It will be recollected that out of the Insurance Fund a sum of one shilling and threepence per head was to be allotted to the treatment of insured persons suffering from tuberculosis. Question might well arise as to the sufficiency of this sum for this purpose, and especially of that left for institutional treatment after sixpence of the original amount was transferred to

the cost of administration of medical benefit for the purpose of inclusion therein of the domiciliary treatment of tuberculous patients. The extension of institutional treatment to the dependants of insured persons obviously involves much larger expenditure, for which the amount from the Insurance Fund would be wholly inadequate. Hence the necessity for a complete change in the arrangements to be made for dealing with this subject. The Councils of Counties and County Boroughs are now invited to take upon themselves the whole administration so far as institutional treatment is concerned for all persons, whether insured persons, dependants of insured persons, or other persons. The domiciliary treatment of insured persons will now be given as part of the medical benefits, leaving the domiciliary treatment of all persons, other than insured persons, in its present position. The amount of the annual grant to County Councils and County Borough Councils to meet their expenditure will be one half of the total net cost incurred by them after deducting the amounts received from Insurance Committees out of the money available under the National Insurance Act for sanatorium benefit.

The Board propose that the head of the dispensary must be a medical practitioner specially trained in the diagnosis and treatment of tuberculosis, whose services will be available for treating cases at the dispensary and as a consultant, that he should also be prepared to act as medical adviser to the Insurance Committee for purposes of sanatorium benefits, on terms to be agreed on between the Council and the Insurance Committee, and he should not be engaged in private general practice. He is, when necessary, to consult the medical officer of health as to the home conditions of patients, inasmuch as these may often necessarily have to be taken into consideration in determining whether the patient should be removed to a residential institution.

It does not appear that the claims which have been put forward that treatment at the dispensary should be undertaken by general medical practitioners are recognised by the Board. We read that when medical assistants are employed at a dispensary they should not (as a general rule) be engaged in private general practice, and that for the utilisation of their surplus time, if any, their office might be combined with other public medical appointments, such as medical officer of health, assistant school medical officer, public vaccinator, police surgeon, etc., when these are held

THE TUBERCULOSIS REGULATIONS, 1912.

THESE regulations—which will be operative by the time that this note comes before the reader—repeal the three series of regulations (those of December, 1908, and March and December, 1911) relating to the notification of pulmonary tuberculosis, simplify the system of notification and extend it to all forms of tuberculosis. The need of simplification has been recognised by the Society for some time, but it is conceivable that the extension of notification to forms of tuberculosis other than the pulmonary will be somewhat a surprise to the most ardent believer in the efficacy of the administrative control of disease.

As late as 1907 the Local Government Board expressed the view that the time had not then arrived for considering the advisability of making pulmonary tuberculosis compulsorily notifiable, and in the autumn of that year the President of the Board declined to receive a deputation appointed by a conference of metropolitan city, and borough councils to lay before him the arguments which had led the conference to adopt, by a large majority, a resolution urging the Board to make the disease notifiable. In 1909 cases of pulmonary tuberculosis in Poor Law patients were made notifiable (by the regulations of December, 1908), in 1911 cases in institutional patients (by the regulations of March, 1911), and in 1912 those in private practice (by the regulations of December, 1911). Now, just six years later, all forms of tuberculosis are to be notified irrespective of any question of any possibility of the conveyance of the disease (in its "closed" forms) from person to person. We do not wish it to be thought that we are in any way objecting to the inclusion of such forms in the system of notification, an inclusion which is necessary for the execution of the proposed "scheme of treatment" of the disease which is one of the results of the National Insurance Act, we simply mention the facts as evidence of the great change which has taken place in the official attitude towards the disease. One important limitation to the cases to be notified is imposed by Article VIII. (*Diagnosis of Tuberculosis*), which directs that a "practitioner shall be deemed to have become aware that a person is suffering from tuberculosis when he has arrived at this conclusion from evidence other than that derived solely from tuberculin tests applied to that person." Such limitation

is very necessary having regard to the frequency with which positive results can be obtained with certain of those tests and the uncertainty attaching to the meaning of such results.

Exceptions to the requirement of notification are made in the case of the inmates of prisons, reformatories and industrial institutions and criminal lunatic asylums, the medical examination of candidates for some office in appointment or by the medical examiner of an insurance company when a person proposes to insure his life, by the medical examiner of the passengers and crew of an emigrant ship, and by the certifying or appointed surgeon under the Factory and Workshops Act, and in respect of the inmates of buildings, ships, etc., belonging to His Majesty the King.

The new regulations approximate so closely to the old that it does not appear to be necessary to examine their provisions in detail, but attention may be directed to one or two matters of special interest.

In the first place, one form only is provided for "primary" notification—Form A—which agrees closely with the form used in connection with the regulations of December, 1911, but in the new form the occupation of the patient and the address of the certifying practitioner have to be stated. It is a somewhat serious defect that no provision has been made in Form A for any statement as to the capacity in which the practitioner makes out the certificate. The defect can be remedied by printing at the foot of the certificate a list of the capacities in which such practitioner may be called upon to certify, such as that given in the "Table of Fees" to be found in Schedule B. As the fees are in every case to be sent to the practitioners without any statement of claim being sent in, there must be some indication of Form A to guide the medical officer of health as to the fee to be credited to the certifying practitioner.

Notification by the master of a workhouse and by the relieving officers is abolished and medical superintendents of Poor Law Institutions are required to send in weekly returns only of admissions and discharges, for which special forms (C and D) are provided. Those forms do not include the dates of admission (or discharge). Medical superintendents of sanatoria are likewise to make weekly returns of admissions and discharges, using the same forms C and D.

Notifications of patients treated at any institution (whether as in- or out-patients) are to be sent to the medical officers of health of the districts where such patients reside, not to the

medical officer of health of the district in which the institution is situated. This change will save medical officers of health a considerable amount of clerical work, and the change is the more welcome, having regard to the very great increase in the number of notifications which the new regulations will inevitably entail. At the same time medical officers of health are still responsible for the forwarding to the proper officers any notifications sent to them in error and of informing the certifying practitioners that the certificates have been so forwarded.

Only two scales of fees will be in force for "primary" notifications, one (2s. 6d.) for certificates from private practitioners, and the other (1s.) for medical officers of institutions. For Forms C and D one shilling is to be paid for the first entry on each form, and threepence for each subsequent. No fees will be payable for any certificates or forms sent in by the medical officers of approved dispensaries or of sanatoria.

The medical officer of health of a non-county area is to send each week to the medical officer of health of the county lists of the cases for which primary notifications have been received, and copies of the returns of admissions and discharges to and from Poor Law institutions and sanatoria.

Two thoughts will occur to anyone studying the regulations who has a practical knowledge of sanitary administration. The working of the regulations means a great increase in the clerical work of a public health department, and a still greater increase is inevitable in the work of supervision (visiting, etc.) of patients, unless the regulations are to degenerate into a mere machinery for collecting statistical data. "Economy" (?) is the watchword of most local sanitary administrations, and many medical officers of health will, doubtless, experience great difficulty in securing the staffs required for the efficient use of the new regulations. The regulations make no provision for the appointment of the necessary assistants to medical officers of health. Indeed, so far, the Local Government Board has never interested itself in the question of clerical assistance, while as regards inspectors the efforts of the Board do not err on the side of undue interference. The imposition of new duties of the magnitude implied by the new Regulations becomes little better than farcical, unless the Government takes steps to see that adequate staffs are appointed to carry out the duties.

"Tuberculosis" is a disease common to man and to, some, at least of, the domestic animals, and is, moreover, capable of being transferred from the latter to the former. A "crusade" against "tuberculosis" in man will be more or less incomplete, and to that extent ineffective, unless such "crusade" be extended to the disease in the domestic animals. A new Order, to be issued by the Board of Agriculture and Fisheries, has been promised in connection with the Milk and Dairies Bill now before Parliament. Assuming that the promised Order will be drafted with a view to safeguarding public health, rather than private interests, the machinery for combating tuberculosis will be fairly complete when the present regulations have been supplemented by the Order in question.

CAMBRIDGESHIRE.—In his summary of the reports of district medical officers of health in the county, Dr. Robinson, the county medical officer, reviews the work done and the progress made during 1911. In connection with housing most of the authorities have done a considerable amount of work. The borough authority submitted a scheme to the Local Government Board, and others made progress or took preliminary steps in relation to schemes. With regard to cowsheds it is noted that generally the condition of the premises is not satisfactory, and that the number of inspections made is not adequate. Sampling under the "Sale of Food and Drugs Acts" is carried out by the county police and all samples taken were reported to be genuine. Dr. Robinson copies a paragraph from the circular accompanying "The Public Health (Milk and Cream) Regulations, 1912," which points out the desirability of placing the supervision of action under the Regulations in the hands of the medical officer of health. The only authority in the county which has adopted the Notification of Births Act is that of the borough of Cambridge. During the year Dr. Robinson made a careful inquiry into the means adopted for the protection from contamination of meat in butchers' shops, and submitted a special report thereon to the county council. The conclusions arrived at as regards the protection which it is desirable to adopt he summarises in his annual report as follows:—(1) A glazed shop-front; (2) thorough ventilation (the best system observed was an open iron-work grille above the glazed front with an ample opening at the back of the shop); (3) sunblinds in summer; (4) cold storage where practicable; (5) no meat to be hung outside the shop; (6) application of tar preparations to rural roads; (7) efficient street scavenging in towns.

COMPULSORY NOTIFICATION OF TUBERCULOSIS. ITS CONSEQUENCES.

MANY years have passed since Dr. Bernheim submitted his papers on this subject. The Academy of Medicine adopted his conclusions after extended discussion, and endorsed voluntary notification of tuberculosis. In England, some of the States of N. America, Germany, Austria, the Argentine Republic, notification of tuberculosis has been decreed and has been in force for some years without prejudice to the patient, and with the best results *quâ* prevention. In effect, this preventive method, which ought to be extended in application to the whole of France and Spain, is *de facto* if not *de jure* in force.

The anti-tuberculosis dispensaries, so beneficial to the working classes, have been established for the discovery of centres of the disease, and for the checking of the spread of infection. In towns where dispensaries are in operation, the majority of the tuberculous are on registers, and live under the benevolent watchfulness of the medical police, and of officials of the institution who are concerned to see that the infected dwellings are marked down. Here then is a means for facilitating the compulsory declaration of the disease. The obligation imposed by legislation works differently in dispensaries and sanatoria. There is no intention to degrade the tuberculous to the rank of human pariahs, nor to expose the unfortunate patients to public obliquy, nor to create "Tuberculoseries." With due safeguard, notification inflicts no harm to family honour, arguments such as these indicate an exaggerated sentimentalism. On the contrary, a tuberculous patient, whether rich or poor, after his disease has been notified, will be surrounded with care; he and his will receive sanitary education, and simple preventative measures will ameliorate such of his surroundings as are hostile to his recovery.

The amelioration of the condition of the patient is the cardinal principle of compulsory notification, whatever may be his social status. Already, should he be a member of a mutual aid society, he gets immediate material and moral help, he does not feel isolated.

CHEAP MEALS FOR SCHOOL CHILDREN.—The Macclesfield Education Committee have decided to open a canteen or school children's restaurant where any elementary school scholar will be able to get a square meal for, say, twopence, or possibly, at something less. In addition, Dr. Marsh, the school medical officer, has been empowered to grant free meals to those children who are not properly fed, or insufficiently nourished through shortage of food or injudicious feeding. It is anticipated that this school children's cheap restaurant will be self-supporting, or nearly so.

REVIEWS.

PUBLIC HEALTH LAW. An Epitome of Law applicable to England and Wales and Scotland. By William Robertson, M.D., D.P.H., Medical Officer of Health, Leith; and Archibald McKendrick, F.R.C.S. (Edin.), D.P.H. Edinburgh: E. and S. Livingstone, 1912, pp. 397.

Having regard to the number and complexity of the legal enactments bearing upon public health with which the candidate for a qualification in state medicine is expected to be acquainted there can be no doubt that an epitome of some sort is absolutely essential. Of writers and teachers willing to undertake the dreary work of epitomizing there seems to be no lack, and, more especially, during the last few years there has been quite a rush on the part of these to get out books to meet the needs of the student. The volume at present under review is, so far as is known, the latest, and like each one of the others it differs from and resembles all the rest. The chief point of distinction is that it deals with the laws of Scotland as well as those of England and Wales, refers to the Acts of London and Ireland, and contains a short chapter on vital statistics. The writers being Scotch the law of Scotland is given pride of place and is perhaps more fully treated of than the law of the other countries. The system applied in each case is, however, the same, each section under each heading in each Act being summarized, the main provisions being printed in bolder type than those which seemed to the authors to be less important to the student. To the majority of the sections there is added a note in small print explaining the section generally, and drawing attention to any other section in any other enactment which has to be read along with or borne in mind in connection with it. The book is calculated to be useful to students. If anything it is rather large for the man who is attempting to get the qualification in the few months usually allowed for the purpose, but it has the advantage of a good index and its geography, a most important thing in any book, is easily learned.

METHODS IN CHEMICAL ANALYSIS. Compiled by F. Austin Gooch, Professor of Chemistry and Director of the Kent Chemical Laboratory in Yale University, pp. 536. Messrs. Chapman and Hall, Ltd., London, 1912.

Although this work contains much useful matter relating to chemical procedure, there is no special reference either to those items of chemical work undertaken in the Public Health Laboratory or to those employed in the analysis of foods and drugs. It is a noteworthy publication in book form of the principal results reached by workers in the Kent Chemical Laboratory of Yale University; and it affords testimony to an excellent output of useful and in many respects original work.

HYGIENE FOR HEALTH VISITORS, SCHOOL NURSES AND SOCIAL WORKERS. By C. W. Hutt, M.A., B.C. Cantab., D.P.H. (Oxf.); Senior School Doctor, Brighton. London: P. S. King & Son, 1912, pp. 146. Price, 7s. 6d. net.

The title of this volume, in the main, indicates for whom it is intended. The author hopes in addition, however, that it may be of service to all interested in social problems, and he has dedicated it to the health committee of one of the districts in which he has worked. In order that the book may assist those who are desirous of qualifying as health visitors, Dr. Hutt has taken the syllabus of the Royal Sanitary Institute Examination for Health Visitors, and has written a chapter round the majority of the items in the syllabus. There are thus chapters on elementary physiology, food, water, personal hygiene, the care of infants and young children, the dwelling and so on. Additional chapters giving information with regard to institutions of use to workers and as to sanitary law—the latter rather scrappy and not of much practical value—are also included. For a great deal of the material given under the various headings the author is indebted, as he admits in his preface, to a number of writers whom he names. Many of the illustrations shown are also reproduced from other publications, and most of them are old friends. The chosen sources of information are, in the majority of instances, excellent, and there is little fault to be found with the matter of the book. It is, however, open to criticism in some other respects. The author has a tendency to arrange his facts in such a way and to number them so that the book is liable to be classed with the crams, and, reading somewhat like a catalogue, to fail in its appeal to those who might like to use it as a text-book.

THE FOOD INSPECTOR'S ENCYCLOPEDIA. By A. Horace Walker, M.R.San.I., Sanitary Inspector, Metropolitan Borough of St. Pancras. London: Baillière, Tindall & Cox, 1912. Demy 8vo., pp. 303. Price, 7s. 6d. net.

The labour entailed in preparing this book must have been tremendous, but it was worth undertaking, and the author has produced a volume which will be immensely useful to all concerned in any way with meat and food inspection. Even the medical officer of health need not be ashamed to have it on his bookshelves, and the food inspector will probably find himself unable to get on without it. Practically every form of food is described; all the commoner and most of the rarer diseases relating to foods are referred to; the chief points in connection with the places visited by the food inspector are detailed, and every word, term, or phrase which may be heard, defined. Where the author found much of his information is a mystery; how he knew that the information he wanted to give was to be found in the places

which he looked for it is still more mysterious. The book is not intended for anything else than, as the title suggests, an encyclopædia, nevertheless, it is easy to read and it is possible to spend quite a pleasant hour with it. The book may be unhesitatingly recommended and Mr. Walker congratulated, not only on having prepared it, but also on the great improvement which has taken place in his writing and bookmaking since the issue of his most useful volume on the inspection of fish, fruit, etc.

LEAD POISONING AND LEAD ABSORPTION. By Thomas M. Legge, M.D., D.P.H., and Kenneth W. Goadby, M.R.C.S., D.P.H., pp. 308.

This volume is one of the International Medical Monographs issued under the general editorship of Drs. Leonard Hill and William Bullock. It presents in eminently readable form the administrative experience of Dr. Legge, as well as the clinical and pathological observations and research of Dr. Goadby. With the exception of chapter vi, relating mainly to breathing, feeding and inoculation experiments by Dr. Goadby, the subject matter throughout has been worked upon by both authors, thus enhancing the scope of the volume. There is much of interest in the book, and the chapter dealing with the statistics of plumbism is written in a clear and temperate manner, and should be read by all medical officers of health who would desire to make the best use of statistical methods in elucidating public health problems. It is stated that lead is peculiarly a cumulative poison, and that lead poisoning of industrial origin is rarely, if ever, acute. The channels by which lead may enter the body are classified as (1) the respiratory, (2) the gastro-intestinal, and (3) the cutaneous, and it is emphasised that the chief of these is the respiratory. Few cases of lead poisoning occur as the result of cutaneous absorption. In the chapter dealing with preventive measures against lead-poisoning all who are interested in the subject will find the fullest information. Amongst other matters the significance of the two commonest signs—the blue line and anæmia—is dealt with. Factory surgeons who are called upon to inspect, periodically, lead workers should regard both of these as danger signals. It cannot be too strongly insisted upon that the blue line is usually indicative of lead absorption and not of lead poisoning, and when it is seen it may be stated that poisoning, not necessarily of the individual in whom the line is pronounced, but among the workers is inevitable unless adequate precautions are adopted. The book concludes with a description of the trade processes in which lead is used and the dangers arising therefrom, together with a statement of the preventive measures which are or may be

taken in each instance. The references given at the end of each chapter and the full index will prove of much value to those who desire any information on the subject with which this admirable work deals.

"THE CARRIER PROBLEM IN INFECTIOUS DISEASE."

By J. C. G. Ledingham, M.B., D.Sc., Chief Bacteriologist Lister Institute of Preventive Medicine, and J. A. Arkwright, M.D., Assistant-Bacteriologist Lister Institute of Preventive Medicine. International Medical Monographs. Edward Arnold, London.

The doctrine of the propagation of infectious disease by means of human carriers is one of supreme importance to sanitarians, and although the promulgation of the doctrine is of quite recent date a vast amount of evidence, both epidemiological and bacteriological, has been accumulated in its support. It is the bacteriologist to whom we are indebted for our knowledge concerning carriers, and with this knowledge we appear to have been afforded explanation of many outbreaks of diseases which in former years would have been puzzling in the extreme. Our knowledge of this subject is, however, not yet complete.

It is in connexion with the typhoid carrier, whose importance in the spread of the disease was first clearly recognised by Koch in 1902, that the greatest amount of research work has been carried out. In this country the names of Dr. Davies of Bristol, from the epidemiological side, and of Dr. Ledingham, one of the joint authors of this volume, from the bacteriological standpoint, are particularly associated with the carrier question. The latter's admirable report on the typhoid carrier furnished to the Local Government Board forms the basis of the section in this volume devoted to that subject.

The monograph also deals with diphtheria, dysentery and cholera, which are allotted to Dr. Arkwright, whose researches on the diphtheria bacillus are well-known, while Dr. Ledingham also deals with paratyphoid fever and cerebro-spinal meningitis.

Although it is with these diseases that the subject is chiefly associated at present it is more than probable that other diseases will be added to the list whenever the causal agent has been discovered and sufficiently investigated.

This volume, the only one yet published embracing the whole subject of carriers up to the present stage of investigation, is most opportune, and coming as it does from the pens of those who are masters of the subject cannot fail to be of the greatest service to the epidemiologist and to sanitarians in general.

The authors have apparently spared no pains to make the volume complete, an ample bibliography being provided under each section.

THE CHADWICK TRUST.

LECTURES ON HYGIENE AND SANITARY SCIENCE,
1913.

THE Chadwick Trust, founded in 1895, under the will of the late eminent sanitarian, Sir Edwin Chadwick, K.C.B., has arranged for a series of public lectures to be delivered during this year in London and certain provincial towns.

The object of the Trust is the promotion of sanitary science in all or any of its branches in various ways indicated by the founder, or otherwise at the discretion of the trustees.

The first of the courses of lectures will be given on Friday evenings, February 7th, 14th, and 21st, at 8.15 p.m., at the Royal Sanitary Institute, Buckingham Palace Road, by Mr. H. Percy Boulnois, M.Inst.C.E., on "Hygiene of the Home." The chairman of the Chadwick Trust, Sir William J. Collins, M.D., B.Sc., M.S., F.R.C.S., will preside on the first evening. Students and the general public will doubtless welcome these lectures, with their informations and suggestions concerning the hygienic values of life's most intimate environment.

In April, Dr. J. T. C. Nash, D.P.H., will be prepared with three disquisitions on "The Evolution of Epidemics," to be delivered at the London County Hall, Spring Gardens. The experience of Dr. Nash as a county and school officer of health should make these lectures particularly interesting. Sir Alexander Binnie, M.Inst.C.E., will be the chairman on behalf of the Trust at the first lecture.

In June, Dr. F. W. Mott, F.R.S., will give a course at the Royal Society of Arts under the title of "Nature and Nurture in Mental Development." It may be confidently expected that much enlightenment regarding mental and eugenic factors in health and disease will be derived from Dr. Mott's discourses. Sir James Crichton Browne, M.D., F.R.S., also a Chadwick trustee, will preside at the first lecture.

Among the lectures in contemplation for the provincial cities, are those on "The Public Milk Supply—Some Criticisms and Suggestions from the Public Health Standpoint," by Prof. Henry R. Kenwood, at Manchester, and on "Water Supply" with exhaustive consideration of sources, collecting works, conveyance and distribution, by Mr. E. P. Hill, M.Inst.C.E., at Birmingham.

Glasgow, Bristol and other cities of the Kingdom will also be provided with Chadwick public lectures during the year.

All the lectures will be free and open to the public, but will be of a character to attract post-graduate and advanced students of engineering, medicine and other cognate sciences.

ISOLATION OF CASES OF PUERPERAL FEVER.

INQUIRIES were recently addressed by the Medical Officer of Health of Brighton to the medical officers of health of the larger towns in (excluding the county of London) as to the admission of puerperal fever cases to their isolation hospitals. Forty-two replies were received. In 33 towns no cases were admitted; in five, cases were regularly admitted. Of the remaining four towns: in three, cases were admitted if there was accommodation; in one, pauper cases only were admitted.

The five towns which admit cases regularly are all very large towns with populations varying from 230 to 750 thousand. In these large centres it is easier to provide special accommodation because of the greater number of cases which occur. One large town has arranged to have cases of puerperal fever treated at the Women's Hospital; a ward has been set aside for the purpose, and very good results are being obtained by the gynaecological surgeons who have the cases in hand.

No medical officer of health reports the spread of the disease after notification. The disease diagnosed and simple precautions taken, it would appear that isolation at an infectious disease hospital is unnecessary from the point of view of the spread of infection. Sanitary authorities have therefore no duty with regard to such patients, as they are only concerned with proper isolation and not directly with treatment.

The duty of Boards of Guardians in this matter is defined by the Local Government Board as follows:—

"Where a person suffering from illness, including infectious disease, is destitute, it is the duty of the Guardians, or, in the interval between their meetings, of the relieving officer, to give such relief as the case may require, and, if necessary, to arrange for the admission of the patient to a hospital. Where, however, such removal is only required for purposes of isolation, and the person to be removed is not destitute, the Guardians have no duty, and the necessary provision should be made by the sanitary authority. The test of the Guardians' duty in the matter is the destitution of the patient, and this will not necessarily depend upon his being in the actual receipt of relief, but may consist in his being unable to obtain at his own cost the requisite medical attendance, nursing and accommodation."—*Lumley's Public Health Act*.

It is evident, therefore, that the treatment of puerperal fever should be carried out in isolation hospitals—only if it is convenient for the local authority to undertake the work and if the Guardians make adequate payment for the treatment.

AN ENGLISH-SPEAKING CONFERENCE on Infant Mortality will be held at the Caxton Hall on August 4 and 5, under the presidency of Mr. John Burns, President of the Local Government Board. The conference is being organised by the National Association for the Prevention of Infant Mortality. Delegates from the Overseas Dominions and other English-speaking countries have promised to attend.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856. RECONSTRUCTED 1888.
INCORPORATED 1892.

AN ORDINARY MEETING of the Society of Medical Officers of Health was held at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, January 10th, 1913. In the absence of the President, Sir Shirley Murphy took the chair. Present: Drs. J. W. Cook, A. B. McMaster, J. A. Gibson, R. Dudfield, W. H. Symons, T. Ridley Bailey, J. D. McCrindle, A. E. Porter, S. C. Lawrence, J. Williamson, F. J. Allan, Frank Robinson, P. W. Spaul, Wm. Butler, John Taylor, C. Sanders, J. Tate, A. Ball, T. M. Legge, Harold Coates, H. Beale Collins, R. H. Wilshaw, J. J. Paterson, J. Howard Jones, E. F. Thomas, J. J. Buchan, F. C. Linton, J. S. Tew, Herbert Jones, and Randle Harper and W. Defries (Associates), also the following visitors: Dr. Collis, Dr. Goadby and S. Smith, B. M. Bond, E. G. Couzens, J. Livesey, F. H. Daly, R. L. Grosvenor, R. H. Frazer, C. A. Taylor, C. S. Hunt, W. E. Harding, C. B. Ross, R. U. Shaxby, P. M. Elton, N. A. Haynes.

MINUTES.—The minutes of the previous ordinary meeting held on December 13th, 1912, and published in PUBLIC HEALTH (January, 1913, p. 118), were taken as read, approved and duly signed by the chairman.

ELECTION OF FELLOWS.—The following candidates, who had been duly nominated, were balloted for and were declared by the President duly elected:—

Henry Bott, M.R.C.S., L.R.C.P., 295 High Street, Brentford, Middlesex; Leonard Bousfield, M.A., M.D., D.P.H., Khartoum, Sudan; Henry Holroyd, M.B., B.S., D.P.H., 26 Broad Street, Hereford; John Holroyde, F.R.C.S., D.P.H., Town Hall, Chatham, Kent; David Connor Kirkhope, M.D., Ch.M., D.P.H., St. Denys, Oliver Road, Leyton, Essex; Thomas Freeman Long, M.R.C.S., L.R.C.P., Chesham, Bucks; Burgess MacPhee, M.B., Ch.B., Isolation Hospital, Southampton; Richard G. Markham, M.B., Ch.B., D.P.H., 10 St. Matthew Street, Burnley, Lancashire; Thomas Rhind, M.R.C.S., L.R.C.P., D.P.H., Hawkesbury Upton, Badminton, Gloucestershire; H. G. Smith, M.B., B.S., M.R.C.S., L.R.C.P., D.P.H., "Springfield," Springfield Place, Barnsley; Berners G. Sumpter, M.B., M.R.C.S., Hunstanton, Norfolk; William Allan Young, M.B., Ch.B., D.P.H., Municipal Offices, Southampton.

NOMINATIONS.—The Honorary Secretary read a list of nominations for election to the Fellowship of the Society.

PRESENTATION OF PORTRAIT OF DR. SPOTTISWOODE CAMERON.—DR. HERBERT JONES, in making a presentation, on behalf of the Yorkshire Branch, of the portrait of Dr. Spottiswoode Cameron to be hung in the Society's Hall, said that, unfortunately, there was no member of the Yorkshire Branch

present, but he had very happy recollections of the time when he was placed in Yorkshire, and of the very pleasant association which he had had with Dr. Spottiswoode Cameron. Therefore, he took it upon himself on behalf of the Yorkshire Branch to ask the Society to accept the portrait, which had the additional merit of having been executed by Dr. Spottiswoode Cameron's son.

The PRESIDENT said he was sure it would be their wish to receive the portrait of Dr. Spottiswoode Cameron, a Fellow of the Society whom they all respected and esteemed. He congratulated the son on having produced a most excellent and artistic portrait of his father. He proposed formally that the Society cordially thank the Yorkshire Branch for their admirable gift, and the motion was carried amid applause.

DR. T. M. LEGGE, of the Home Office, then delivered a lecture upon "Exhaust Ventilation in the Removal of Dust and Fumes." The following took part in the subsequent discussion:—The Chairman, Mr. Sydney Smith, H.M. Inspector for Dangerous Trades, Drs. Collis, Goadby, Wm. Butler, Herbert Jones, J. H. Jones and Mr. W. Defries. On the motion of the chairman a vote of thanks was accorded to Dr. Legge for his valuable lecture.

HOME COUNTIES BRANCH.—The fourth meeting of the session 1912-13 was held at the Society's Rooms, 1, Upper Montague Street, Russell Square, W.C., on Wednesday, January 15th, 1913, at 4 p.m.

Present:—Dr. W. J. Howarth, President (in the chair), Drs. A. E. Porter, Tew, Beale Collins, Ransome, Strain, Griffin, Walters, Sloman, Ponder, Kirkhope, Peyton, Linton, Clements, Brebner Dupont, Stevens, D. J. Thomas, Tate, Prior, Arnold, Macalister, West, and George F. Buchan, Hon. Sec. Apologies for absence were received from Drs. Fremantle and Bushnell.

Dr. H. O. West, tuberculosis officer, Kent, read a paper on "The Pros and Cons for the use of Tuberculin in the Diagnosis of Tuberculosis." Discussion followed and was taken part in by the President, Drs. Walters, Porter, Buchan, Dupont, Peyton, and Beale Collins. Dr. West replied, and a unanimous vote of thanks was accorded to him for his paper.

The Milk and Dairies Bill was afterwards discussed and the following resolution, on the motion of Dr. A. E. Porter, seconded by Dr. J. S. Tew, unanimously passed:

"That in the opinion of the Home Counties Branch of the Society of Medical Officers of Health, effective supervision of dairies in accordance with the Milk and Dairies Bill cannot be carried out unless provision be made for security of tenure of office of, and adequate remuneration for additional duties of, and expenses incurred by, the officers of

sanitary authorities on whom the administration of the measure will fall, and that the Council of the Society of Medical Officers of Health be requested to take such steps as may be necessary to endeavour to secure the same."

Dr. Charles Sanders, medical officer of health of the County Borough of West Ham, on the motion of Dr. Beale Collins, seconded by Dr. W. J. Howarth, the President, was nominated unanimously by the Branch for the Presidency of the Society for the session 1913-14.

North-Western Branch.—A meeting of the North-Western Branch was held at the Grosvenor Hotel, Manchester, on Friday, December 20th, 1912. Present:—Dr. Meredith Young (in the chair), Drs. Wheatley, Corbin, Sergeant, Buckley, Holden, Joseph, Brebner, Hitchen, Anderson, Fitzgerald, Marsden, Talent, Paddock, Daley, Hope, Thomson, Chadwick, Gibson, Hibbert, Hawksley and Wynne. Apologies were received from Drs. Barlow, Buchan, Brindley, Peck, Garstang and Greenwood. The minutes of the last meeting were read and confirmed. Dr. W. L. Hawksley read a paper on "Smoke Abatement," which was followed by a long and interesting discussion, in which a large number of the members took part.

A meeting of the above Branch was held at the Grosvenor Hotel, Manchester, on Friday, January 17th, 1913. Present:—Dr. Meredith Young (in the chair), Drs. Peck, McMaster, Holden, Wynne, Berry, Talent, Wright, Corbin, McClure and Buchan. Apologies were received from Drs. Brindley, Hamilton, Rennett, Garstang, Hawksley, Fraser and Barlow. The minutes of the last meeting were read and confirmed. The Branch resolved unanimously to nominate Dr. Herbert Jones for the Presidentship of the Society. An interesting paper on "The International List of Causes of Death" was read by Dr. Wynne. This was followed by a discussion, in which a large number of the members present took part.

Metropolitan Branch.—A meeting of this Branch was held on Friday, January 3rd, 1913, at No. 1, Upper Montague Street, Russell Square, W.C., at 4 p.m. Present: Dr. Annis (in the chair), Drs. Parkes, Wellesley Harris, Glover Lyon, Hamer, Allan, Spaul, Dudfield, Davies, Shrubsall, Sir Shirley Murphy, Caldwell Smith, Jackson, Bryett, Sandilands, Scrase, D. L. Thomas, and Charles Porter, Hon. Sec.

The Branch considered the Public Health (Tuberculosis) Regulations, 1912, and attention having been directed to the fact that, amongst other matters, no provision had been made for the payment of notification fees to medical officers of tuberculosis dispensaries and sanatoria; for the indication by medical practitioners notifying on Form A of the capacity in which they were at

the time acting and for the making of return medical officers of Poor Law institutions, sanatoria on Forms C and D even if no admissions or discharges had taken place, Dr. Dudfield stated that he had written to the Local Government Board with regard to these matters, and would communicate with each medical officer of health in London when a reply was received from the Board.

Arrangements were made with the medical officer of health of the London County Council (Dr. Hamer) with regard to reports by school medical inspectors and returns to be submitted by medical officers of health of Metropolitan cities and boroughs.

APPOINTMENTS.

DR. BERTRAM ADDENBROOKE has been appointed medical officer of health to the Kidderminster R.D.C.

DR. M. B. ARNOLD has been appointed a medical inspector under the Local Government Board.

DR. BALL has been appointed assistant school medical officer to the Leyton U.D.C.

DR. HENRY BARNES has been reappointed medical officer of health to the Ewe Town Council.

DR. J. C. BROCKWELL has been reappointed medical officer of health of Walton-on-the-Naze.

DR. A. BUDD, M.B., B.S. Durh., has been appointed medical officer of health to the Launceston and Bude woodwiger R.D.C.

DR. R. V. CLARK has been appointed medical officer of health of Croydon.

DR. LEONARD CROSSLEY, M.D., has been appointed tuberculosis medical officer for the county of Wiltshire.

DR. STANLEY FOSTER has been appointed medical officer of health for Newport, Isle of Wight.

DR. T. W. JONES has been appointed joint medical officer of health for the borough and rural district of Wrexham.

PROF. H. S. KENWOOD, M.B., D.P.H., has been appointed by the Secretary of State on the Army Medical Advisory Board as civilian sanitary expert.

DR. KING has been appointed school medical officer under the Durham County Council.

DR. R. W. MURPHY has been appointed assistant medical officer of Middlesbrough.

DR. J. KING PATRICK, senior assistant medical officer of health for Leicester, has been appointed tuberculosis medical officer for Hampstead.

DR. ELLIS PEARSON has been appointed medical officer of health of the borough of Bideford.

DR. GEORGE CARRINGTON PURVIS, M.D., B.Sc. Edin., has been appointed medical officer of health of Grahamstown, Cape Colony.

DR. ROPER has been appointed tuberculosis medical officer to the Cornwall County Council.

DR. J. E. SCALES has been appointed medical officer of health to the Radstock U.D.C.

MR. SYDNEY ARTHUR TUCKER has been appointed assistant school medical officer to the Coventry Education Committee.

DR. R. P. WYLDE has been appointed medical officer of health to the Hellingworth U.D.C.

A CORRECTION.—Dr. J. C. Pickup has been appointed medical officer to the Barnsley Union, Wombwell District, and not medical officer of health to the Wombwell U.D.C., as stated in the January number of PUBLIC HEALTH. Dr. George E. Atkins is medical officer of health to the Wombwell U.D.C.

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VOL. XXVI.

DIPHTHERIA IN SCHOOLS.

SEVERAL points of interest in connection with the behaviour of diphtheria in schools were discussed at the meeting of the Epidemiological Section of the Royal Society of Medicine in January when a Paper on this subject was read by Dr. J. A. H. Brincker. One point of interest was the evidence of the part played by schools in disseminating diphtheria. The change in the age incidence of diphtheria, a mortality coincident with the coming force of the Education Law which made attendance at school compulsory. This change was suggestive of the influence of infection at school for the reason that the incidence upon school age had markedly increased.

In a Paper read at the Epidemiological Society meeting it was pointed out that the behaviour of diphtheria in relation to age incidence was such that these maladies were subject to seasonal variation, and that there was much reason for thinking that this variation was cyclical.

The behaviour was especially manifest in the case of diphtheria, which appears to have a relatively short cycle of perhaps some thirty to forty years. We are thus led to think that the increase of incidence on the school age at the present time was probably due in the main to causes other than the passing of the Elementary Education Act, and was, so far as this Act was concerned, chiefly one of coincidence.

We say chiefly because, as so often is found in the study of epidemiological questions, more than one factor may have been operative in determining a result. Accepting the view that the increase we are discussing was in the main due to seasonal variation, we may consider upon what natural variation immediately depends.

It can be little, if any, doubt that it is due to variation in the quality of infectiousness. If the rate, this is the most likely explanation which can be offered, and hence with increase of infectiousness, if we accept this hypothesis, the tendency of the disease to attack

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persons of an older age in times when epidemic prevalence is being approached and attained than in times when the prevalence is but small. Obviously, however, any changed condition in the community which gives opportunity for increase in infectiousness to manifest itself would add to the result of spread of disease, and in considering the question of larger aggregation of children in school, which undoubtedly was the outcome of the passing of the law under consideration, it is clear that a larger opportunity for spread of the disease among the children at school age would, during the period of this increased infectivity, add to the increase of attack of children of this older age. Hence we are probably right in claiming that two factors have been concerned in the change we are discussing, of which the larger factor is increase in infectiousness.

Dr. Brincker mentioned another peculiarity of diphtheria, viz., "that it may invade a school, and, in spite of the epidemiologist and bacteriologist, will recur with singular regularity for one, two, or more years, and finally disappear altogether." This is what we might expect if we thought of variation in infectiousness being often transient and limited to a particular community. There would, in fact, be a strain of bacillus operating in the area and leading to disease being spread from one to another person different from that operating elsewhere. Hence the ability to take advantage of attendance at a particular school and spread among its scholars. Now Dr. Thomas, of the London Public Health Department, stated that he had often noted that children with Klebs-Löffler bacilli in their throat might be associated at school and in class with other children without any evidence of mischief to the latter. Evidently the bacillus does not always possess pathogenic properties. If we conceive its spread from one person to another, finding in one an additional element required to produce disease and not finding it in another, the hypothesis would meet the requirements of the facts which are observed.

It is a frequent occurrence that we find in local prevalences not conspicuously related to school infection, that the age distribution of the cases is exceptional, and that children of school age are being especially attacked. Increased infectivity may be leading to infection in the school, but at this early stage there may be no especial relation in the school of the children who manifest disease. One may be attacked in one class, another in another class, in such a way as to obscure any evidence that school attendance is concerned with the result. It is, therefore, of the first importance to study at the outset the age distribution of the cases as soon as any undue number appears in a locality, and to watch the subsequent behaviour of the disease as time progresses. Often enough the number increases until a particular class or department is conspicuously attacked—frequently the infants' department.

The part played by carrier cases naturally had its place in Dr. Brincker's Paper and in the discussion thereon, some striking examples illustrating the apparent intermittent infectivity of persons long after attack were mentioned by him. Dr. Butler suggested that we might possibly find explanation of the recrudescence of infectious disease in communities after long periods of absence in the hypothesis that it was due to an alteration in a permanently existent virus rather than to the re-introduction of the virus after its absence. Of course, if we recognise change in the quality of infectiousness we can understand, on the other hand, that the new strain would have opportunity of extending its operations more widely, and thus of invading localities in which no vestige of the bacillus had for years existed.

The hypothesis that in localities where it is endemic the disease is maintained by unrecognised or unrecognisable cases, provides explanation of the decrease in the number of cases occurring in August in London when the schools are closed for the summer holiday. This is obviously not due to emigration, seeing that a curve based on the total notified cases in England and Wales manifests the same decrease in that month as the London curve, and, again, it is not due to the necessarily diminished observation of school officers at that time, as it is also conspicuous in a curve based upon the death returns. The fact affords explanation of the maintenance of infectious diseases in the community through the existence of cases which escape recognition, but which are none the less operative when facilities exist for them to be so.

PATHOGENICITY AND VIRULENCE OF BACTERIA.

A PAPER by Drs. Thiele and Eml read recently (January 21st) before the Pathological Section of the Royal Society of Medicine, deals with a subject of considerable interest to public health workers, *i.e.*, the transference of non-pathogenic into pathogenic bacteria. The authors do not subscribe to the ordinary conceptions of endo- and exo-toxins. In their view endo-toxins do not exist, that the bacterium neither liberates a primarily toxic substance nor is the bacterial protoplasm directly toxic. Toxic substances are produced by the action of anti-bodies upon the bacterial protoplasm. These anti-bodies or tissue-ferments produce proteolytic degradation bodies which are both toxic and anti-phagocytic.

They have demonstrated a toxic substance present in the blood and effusions of animals dying from bacterial infections, the same substance being found whatever the bacterium causing the infection. This substance when injected intravenously into guinea pigs, in doses of five to ten c.c., produces acute death with the typical symptoms and post-mortem appearances of poisoning from proteolytic degradation bodies. This toxic substance in large amounts produces death, in lesser amounts fall of temperature and in small amounts fever. In their opinion this substance is the cause of death in all bacterial infections.

Toxicity of a bacterium in their view depends upon two factors: (1) the ease with which its protoplasm is accessible to ferment action and (2) the nature and amount of ferment present. The specific anti-bodies or ferments act on the bacteria and cause an accumulation of proteolytic degradation bodies which inhibit phagocytosis and allow the bacteria to multiply.

Immunity of an animal to a given bacterium, on their view, depends either upon the bacteria being unacted upon by the ferments or the bacteria are so rapidly broken up by the ferments present that the proteolytic degradation products produced are so quickly reduced to non-toxic ones that the bacteria are innocuous. The opposite, susceptibility of an animal to a bacterium, results if the ferments can split off from the bacterium toxic substances in amount sufficient to inhibit phagocytosis.

They divide non-pathogenic bacteria into two groups.

(a) Organisms such as *B. mycoides*, *B. smegmatis*, the Timothy grass bacillus, etc.,

are non-pathogenic because the ferment activity normally is very low.

Organisms such as Hoffmann's bacillus, *Staphylococcus pyogenes*, etc., in which ferment activity is very high, the immunity being due to a rapid breakdown of the toxic anti-phagocytic substance.

The authors rendered the first group pathogenic to guinea pigs, with the production of a fatal septicæmia, by first sensitising the animals by injection of doses of dead bacteria of the kind under investigation (homologous bacteria). The sensitive period for infection was from 6 to 10 days after the sensitising dose. In this way they increased the ferment activity.

With the second group pathogenicity was secured by injecting the bacteria in a medium, which hindered and delayed ferment activity thus preventing the rapid breaking down of the bacteria. The methods employed were the injection of the bacteria in 15 and 30 per cent. gelatin and in 2, 3, and 5 per cent. saline.

For both groups the bacteria which had been rendered pathogenic had become sufficiently virulent to produce septicæmia in normal animals including species other than those originally used.

For example, *B. mycoides* after several passages eventually became so virulent that one-twentieth of a 24 hours old agar slope culture killed a normal guinea pig in about 36 hours. The bacillus lost its flagella and developed a capsule.

With both *B. diphtheriæ* and Hoffmann's bacillus they were able to obtain a fatal septicæmia, by means of their gelatine and saline methods and to demonstrate in the blood of these animals the proteolytic degradation body present in all animals dying of septicæmia. —WILLIAM G. SAVAGE.

SCHOOL-SHOES FOR CHILDREN.—Amongst the items of news contained in the monthly reports on the primary schools of the German Empire is the following:—In one district the local authorities have decided to provide the children with felt shoes to be worn during school hours. This is at Pollwitz, near G. . . . The medical officer had made several complaints as to the general inefficiency of the footwear of the children, and had pointed out that it meant that the children had often to sit through the day in winter with their feet thoroughly wet. With the equipment of felt shoes the authorities have given orders that the other shoes shall be properly dried during the lesson-time.—Standard.

MILK AND DAIRIES BILL, 1912.

By WILLIAM G. SAVAGE, M.D., Author of "Milk and the Public Health."

SPEAKING generally, there are four separate ways in which milk may be responsible for human disease and ill-health. The Milk Bill should be studied from the effect it is likely to have in regard to each of these four ways.

1. Chemical Impoverishment.

The clauses dealing with chemical sophistication in the present Bill are not extensive. Section 16 amends the Sale of Food and Drugs Act by stating that a warranty or invoice shall not be available as a defence. The warranty was open to a great deal of abuse and few will mourn its disappearance. The orders which the Local Government Board are to be empowered to make are extensive, and among them Section 15 (f) and (h) deal with chemical alterations. With the existing law and these powers it should be quite possible to adequately deal with extensive chemical sophistication, but it will still be difficult to deal with the practice of "toning" milk down to the legal limits permitted.

2. Acute Infectious Diseases spread by Milk.

For this purpose the Bill has some useful provisions, which, if enacted, will give much greater powers. It will be convenient to consider these clauses first, and then to consider whether they are sufficient.

The powers are contained in Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, while certain other sections qualify or add to these powers. Sections 2 and 3 are, however, the main sections. They deal with two possibilities, *i.e.*, that the suspected disease may be transmitted by milk derived from cows kept either within or without the area of the notifying authority.

In the former case Section 2 (1) applies. This section contains the very important additional power of inspecting "the persons employed therein." The requirement that the medical officer of health is to inspect the cows only if accompanied by a veterinary surgeon is absurd. It apparently means that he may not inspect to see if the cows are clean. He is as capable as a veterinary surgeon of seeing if cows have clean flanks and clean udders and teats, while most medical officers of health have a working knowledge of ulcerated teats and mastitis conditions. The medical officer of health cannot be expected to trail about a veterinary surgeon with him everywhere. Much of the work of a rural medical officer of health has

to be a mixture of different kinds of work, and it is convenient for him when he is, say, on housing work to give a look in at a neighbouring cowshed. He should not be debarred from inspecting the cattle to see if an emaciated cow is there. If, then, he wants to make sure he can subsequently call in a veterinary inspector. The clause should give him power to inspect the cows and also to inspect with a veterinary inspector if he wants the assistance of one.

The procedure to deal with outbreaks of infectious disease, presumably caused by milk derived from another local authority, is now considerably improved and extended. The new procedure is I think on the right lines, but a number of important details require consideration and some amendments would seem to be necessary. The following points may be mentioned:—

a. The position of the county medical officer of health. A new duty is thrown upon this officer. While it is very reasonable that the county medical officer of health should be at the head of a proper and comprehensive scheme of milk supervision for the whole county, it is open to doubt whether it is expedient that he should be suddenly called off from other work to promptly go perhaps 40 miles to investigate the conditions in a particular dairy, or possibly be called off to investigate two or three dairies at the same time in opposite corners of his county. It must be remembered that the term "Infectious Disease" is wide and the county medical officer of health may get frivolous complaints. At the present time the county medical officer of health is almost entirely an administrative officer and his time is very fully occupied with administrative work. He will very likely be unable to himself go and investigate these outbreaks, and it may have to be done by a specially appointed assistant. The work of a county medical officer of health is not framed and carried out on the supposition that he is an active executive officer.

b. The county medical officer of health, the county borough medical officer of health, and the urban medical officer of health are given no discretion. They have to forthwith investigate whenever the medical officer of health and the notifying authority "has evidence that infectious disease is caused, etc."

Sections 8 and 9 give powers to the dairyman of appeal, and he may recover compensation. It is very proper that he should have powers of appeal, but it means that the medical

officer of health of the responsible authority must be careful of the grounds on which stops any particular milk supply. He has to be in possession of more than a probability. A possible danger I foresee that the local medical officer of health may be possibly led into wrongful action by leading information (*i.e.*, badly collected and inaccurate facts as to incidence upon a particular milk vendor) from the medical officer of health of the notifying authority. For example, a council notifying medical officer of health may state on quite insufficient evidence that he believes scarlet fever is spread by a particular milk supply. The local medical officer of health may carefully investigate and find a person suffering on the farm from a slight sore throat with possibly an obscure history of an old rash. In view of the evidence supplied to him that the outbreak of scarlet fever was due to the milk, he may think it necessary to stop the milk supply on the supposition that this person is an unrecognised case of scarlet fever; an action which he would not feel justified in taking had not the milk been supposed to have set up an outbreak of scarlet fever.

Section 2 (2) only requires the notifying medical officer of health to give notice. He should be required to give reasons for his belief and give the evidence in his possession. It need not take any longer to send this than to send the notice required by the Act.

c. The notice is to the council and not to the medical officer of health. It is obviously impracticable for the county medical officer of health to wait until his authority meets, so that the county council must give a general delegation of authority to its medical officer of health to inspect such outbreaks as they arise. It appears there are given no powers to delegate! Why should not the county medical officer of health and the county borough medical officer of health be themselves notified?

d. It is difficult to see why the presence of a veterinary inspector is obligatory. The medical officer of health should have power to take one with him if he wants one.

e. Some rural district medical officers of health will undoubtedly object to their being entirely left out of the investigation. The general supervision of the dairy business in his district is in his hands, and undoubtedly this officer should be informed of what has taken place, while, if there is time, the county medical officer of health should notify him of his visit.

19 It must be remembered that there is a large number of small urban authorities whose areas contain numerous cowsheds but who do not command the services of whole time local officers of health. These men are not well versed in investigations as to milk-spread infectious diseases, and one considers why they should be entrusted with the investigation of milk-spread outbreaks while rural district medical officers of health are debarred. These small urban authorities will not have made arrangement with veterinary surgeons, and delay will probably occur in doing so before outbreaks are investigated. Unless County Boroughs, the investigations here also should be left to the county medical officer of health.

These powers are valuable and considerable. Are they sufficient? It will be noted that they are essentially directed to the investigation of outbreaks which have already occurred and attempting to stop their further spread.

They do not in themselves do anything to prevent outbreaks; only limit them after they have started. They aim at closing the stable door after many of the steeds have been stolen.

The cow may be, but only rarely is, a cause of human sickness, and in practice mild cases of infectious disease amongst people handling the milk are the common cause of milk-spread outbreaks. The Bill contains no provision for preventing infection from this source.

It is surely recognised that those who handle milk must be healthy, and it should be compulsory for every dairyman to notify all cases of illness in employees and their families to the local sanitary authority. All forms and postages for this should be paid for by that authority. Certificates that no illness has occurred to the dairyman's knowledge should be part of the weekly information supplied by each dairyman to the person to whom he supplies his milk; the latter to provide the special form required. These forms must be shown to the urban inspectors whenever required by them.

3. Tuberculosis prevention.

As we are all aware this is the most serious part of the milk problem. Any legislative activity must be considered from two separate points of view.

(a) The prevention of human infection from bovine sources.

(b) The diminution of bovine tuberculosis.

The tuberculosis sections are in the main an extension of the model milk clauses which have been acquired by a large number of cities and

towns. It is impossible to definitely estimate their probable effect until the Tuberculosis Order of the Board of Agriculture has been issued, but the general effect of the new powers asked for can be judged to some extent.

In the first place, the powers to be given deal not with all cows suffering from tuberculosis, but with only three classes of such cows, *i.e.*, advanced cases with emaciation, udder tuberculosis, and cows known to be yielding tuberculous milk.

These are the only kinds which are an immediate danger to man, and if the milk from these animals could be promptly stopped most of the danger from tuberculous milk would be eliminated. Is this likely to occur if the Bill becomes law?

Much will depend upon the extent and zeal with which the powers in the Bill are put into force, both by the urban authority representing the consumers and the rural authorities representing the producers. Granting an urban authority anxious to safeguard its consumers, if their milk supply is not raised within their own borders, they are restricted in their detection of tuberculosis to the collection and bacteriological examination of milk samples reaching the town. Powers for this are given in Section 13, but at once a great drawback is apparent. For large cities milk often is derived from mixed sources sent in by milk factories and the like. If tubercle bacilli are found in the sample collected it is often a difficult matter to unravel the precise sources of the sample. The Bill contains no provisions for assisting the urban authority. The milk purveyor or contractor is not required to submit any record of the sources of his supply. One of the difficulties of the milk problem, and one which is even more important in relation to acute infectious diseases outbreaks, is to make regulations in regard to keeping records of milk from different sources. Undoubtedly, however, the purveyor could keep, without undue book-keeping, some helpful records, and the authority to require such records should be incorporated into the Bill.

If tubercle bacilli are found (after about 4 weeks' time) the urban authority must proceed under Section 2 (2). As already pointed out, this section should require details of the evidence to be sent. The county medical officer of health or an assistant, accompanied by a veterinary surgeon, must then promptly inspect. There is nothing gained by requiring that two persons should inspect. The only

point to be ascertained is whether one of the three classes of tuberculous cows mentioned in Section 12 is, or has been, on the farm and has been milked. An experienced veterinary surgeon could do this alone, without taking up the time of another officer in addition. Section 2 (2) is trying to combine two quite different matters (acute infectious diseases spread by milk and tuberculosis) which should not be combined since the procedure required is different in each case.

Is the veterinary surgeon likely to find the tuberculous cow and so be able to stop the distribution of tuberculous milk? Practical experience has abundantly demonstrated that the detection of udder tuberculosis by clinical examination alone is a very difficult matter. Under this Bill the veterinary surgeon cannot report the mere probability—he must have reasonable certainty—as otherwise the dairyman may put in operation Section 9 and recover damages.

This will mean either a considerable resort to Section 2 (3) or no definite order being made stopping a tuberculous cow. Most small urban authorities have no arrangements made for laboratory facilities, while many counties have no laboratory of their own, or where they exist have no licence to inoculate animals. This will mean that there will be a tendency for doubtful cases to be left doubtful and no order made.

The benefit of the detection is for the urban authority, and it is not unreasonable to ask that the cost of any confirming bacteriological milk examination should be borne by the urban authority benefitting. I do not think they would object to this.

The Bill itself does not contain adequate powers for dealing with tuberculous cows excreting tubercle bacilli, since there is no provision for preventing their sale with the condition undisclosed, as there should be. The owner should be bound to report what becomes of these animals, and they should be marked so as to be always identified. It is foolish to take so much trouble and expense to trace a dangerously tuberculous cow, and then not to compel the beast to be indelibly marked. There is no provision in the Bill for preventing infection from such animals when found, for forbidding the milk being used for animal food or for disinfecting the premises. Probably, however, these matters will be dealt with in the Tuberculosis Order.

Even if urban and other "consuming" authorities do put these powers into force—and there

is no compulsion whatever upon them to do it is obvious that only a proportion of tuberculous milk, and that probably a small proportion, will be detected and the source of danger eliminated. Inevitably detection can only result after a long period, during which tubercle bacilli have continuously been added to the milk.

This being the case the value of the other procedures for the detection of tuberculous cows which shed tubercle bacilli into milk may be considered. These are the clauses enabling and encouraging the rural authorities to make systematic and periodical inspections to discover infectious tuberculous cows. If these were definitely put into the hands of county councils, and they were to actively undertake the work, undoubtedly very valuable assistance in the work of the prevention of human tuberculosis of bovine origin would be given. This, however, is not apparently the general intention of the Bill.

Apart from Section 15, which gives the Local Government Board power to make orders in regard to "The inspection and examination of dairies and cows therein," there is only Section 2 which may be brought into operation. This section is, however, obviously intended and will be used for special visits only and not for systematic routine inspection.

The fact that Section 14 definitely omits rural authorities shows that the Local Government Board does not contemplate making Rural District Councils provide veterinary inspectors. Without such inspectors the systematic inspection of cows to detect tuberculous cows disseminating tubercle bacilli into the milk will be useless, unless very extensive bacteriological examinations are made. The rural authorities are given no authority in regard to this so that it is evident that systematic inspection of cows in rural districts is not likely to result.

As regards the second point of view—the diminution of bovine tuberculosis—none of the powers given in the Bill are, I believe, likely to be very effective in diminishing the total amount of bovine tuberculosis. If all tuberculous cows were detected directly they became "open" cases, *i.e.*, excreting tubercle bacilli, obviously bovine tuberculosis would steadily diminish. Even if the proposed powers were vigorously put into operation (and this is not likely to result) cases of "open" tuberculosis in cows would only, in general, be detected

period, months or even years in duration, which tubercle bacilli would not only have continuously added to milk but great opportunities for infecting other cows would have been afforded. In other words, no really effective means to prevent the continued manufacture of milk of bovine tuberculosis is to be anticipated. It is undoubtedly necessary to take steps to deal with the immediate danger to man from tubercle bacillus infected milk, and for this purpose the clauses incorporated in the Bill will be useful. At the same time it is essential that these should go hand-in-hand with measures to prevent bovine tuberculosis, as this is the only practical and permanent solution. The Bill contains no section of this nature and such are indeed outside its scope, being concerned with "the prevention of the sale of tuberculous milk." It is to be hoped that steps in the direction of dealing directly with bovine tuberculosis will be contained in other Acts or Orders.⁽¹⁾

4. General Cleanliness, and the Production of Clean Milk.

Section 11 deals with the registration of both dairymen and their dairies, and is a great improvement over existing conditions, whereby the dairy is registered first, whatever the condition, and inspected afterwards. The local authority can refuse to register any premises if they are unsatisfactory. The value of this section is, however, immensely lessened by the fact that the judges are biased and the officers who have to give the advice have no security of tenure. The judges whether a dairy should or should not be registered are a body largely consisting of, or influenced by, those actively interested in the dairying industry. The officer bringing the charge is one whose chances of increased salary, and often his tenure of office, depend upon his being favourably considered by such an authority. These are circumstances in which it is unreasonable to expect too much zeal, and the procedure proposed may frequently be ineffective.

Section 13 has already been referred to as giving power to take samples for bacteriological examination. Systematic samples bacteriologically examined can do much to improve the general cleanliness of milk if the rural authorities to whom the complaints are sent will properly investigate the dairies supplying bacteriologically polluted milk. The chief

(1) The Tuberculosis Order of 1913, issued while this article was in the press, does contain requirements as to notification and slaughter of cows suffering from certain kinds of "open" tuberculosis. These requirements are valuable, but, unless extensively supplemented, it is doubtful if they will be very effectual in diminishing bovine tuberculosis.

powers for dealing with the general contamination of milk are contained in Section 15, which gives the Local Government Board power to issue regulations for numerous purposes. A very great deal can be done to improve milk conditions if such orders are issued.

Sub-section 4 of this section is of importance. A real difficulty at the present time is that the notices—even those requiring structural alterations—have all to be served upon the tenant. Under this section the tenant may by complaint apply to a Court of Summary Jurisdiction, and the Court may apportion the expenses. It seems a cumbersome and unsatisfactory method to deal with the difficulty by inviting litigation between landlord and tenant. It would be simpler to deal with defects in the same way as nuisances under Section 94 of the Public Health Act, 1875—*i.e.*, if caused by occupier, notices to be served on him; if structural defects, notices to be served on the owner.

Two general sections dealing with county councils require consideration.

Section 11 gives county councils power to concurrently exercise powers in rural districts and also in urban districts if the urban council consents. It will be noticed that dual control is given, the powers of the county councils being in addition to, and not substitution for, those of the rural councils.

If a county council puts into operation their powers under this section potentialities of much friction can be foreseen, since, for example, the county and district medical officers of health may hold very different views. For example, what will happen if the district medical officer of health inspects a cowshed, and passes it as satisfactory, and then the county medical officer of health inspects and finds structural defects—a proper floor, for instance, being required? Is the dairyman to provide it and, if he refuses, can he be coerced? This section gives no power to the county council or its officers to override the decision of the district sanitary authority or its officers.

I am of opinion that such dual control is impracticable, and the powers of county councils should be in substitution of, not in addition to, those of rural authorities. The only practicable way would seem to be to put all these powers vested in rural authorities, and those of urban authorities, if they agree, in the hands of county councils, and require them to institute a proper system of supervision and control. Apart from the large

urban authorities themselves taking it up, which is not just now within the range of practical politics, county councils are the only bodies which could carry out a full scheme of inspection and supervision. For a county council to do this, it would be necessary to appoint a large staff of veterinary and sanitary inspectors, while extended bacteriological examinations would have to be undertaken. The expense would be heavy, and it is doubtful how far county councils would be willing to incur it from county rates alone. The benefit is essentially for the urban communities, and it is not reasonable to ask county councils to incur any substantial part of this expense. The funds should be provided from national sources either entirely or substantially.

Section 19 gives powers to county councils to take over the powers of county district authorities on complaint (a) by any four inhabitant householders of the county district, (b) by the parish council or parish meeting of any parish within the district, (c) by the sanitary authority of a district within which milk is supplied from any dairy in the county district. It is rather amusing to see our old friends—four inhabitant householders—being brought out again. It is largely a useless clause in the Housing Acts, and is likely to be still less of value in regard to milk. If this clause is retained a report by the county medical officer of health should be equivalent to such a complaint, as in the Isolation Hospital Act.

Sub-clause *b* is not likely to be any more useful, but Sub-clause *c* may really be valuable.

The county council are not obliged to hold an inquiry or even to cause their officers to investigate, it is purely permissive, and much will depend upon the activity of the county council. To deal with inertia on the part of county councils the Local Government Board have overriding powers. Section 19 should prove a valuable lever in the hands of urban authorities to improve the milk coming into their districts.

Speaking generally, the Bill, in my opinion, contains much that is useful and valuable, but could be considerably strengthened, while obviously it offers but a very partial solution of what is known as the "milk problem."

NOTIFICATION OF VENEREAL DISEASES.—Physicians in the State of Indiana, U.S.A., are now required to make reports to the State Board of Health of all cases of venereal diseases.

THE LATE DR. J. F. J. SYKES.

IT is with much regret we have to record, at the age of 59 years, the death of Dr. J. F. J. Sykes, who was for 28 years medical officer of health of St. Pancras. There are few who will be missed from the circle of his colleagues as Dr. Sykes will be. Possessed of a kind and generous nature, he was always interested in a high degree in the work in which they were all engaged, extending to them his sympathy in their difficulties, and suggesting ways of meeting them. Dr. Sykes was in every sense of the word progressive in his ideas. Fond of the discussion of detail almost to a fault he was still able to look beyond the conception of sanitary administration which occupied men's minds at the moment, and to appreciate the underlying principles to which recognition must be given in the unceasing work of the prevention of disease. He was thus able to extend the sanitary administration of his district on lines which went beyond the administration of the law as defined by Parliament, and to base it upon the education of the people in the observance of rules of health, which were far more important than the mere abatement of nuisances. Imbued with a highly sensitive nature, this conception of the duties of a medical officer of health often provided for him anxieties which would not have been felt by a man less zealous or who appreciated the responsibilities of his office less acutely.

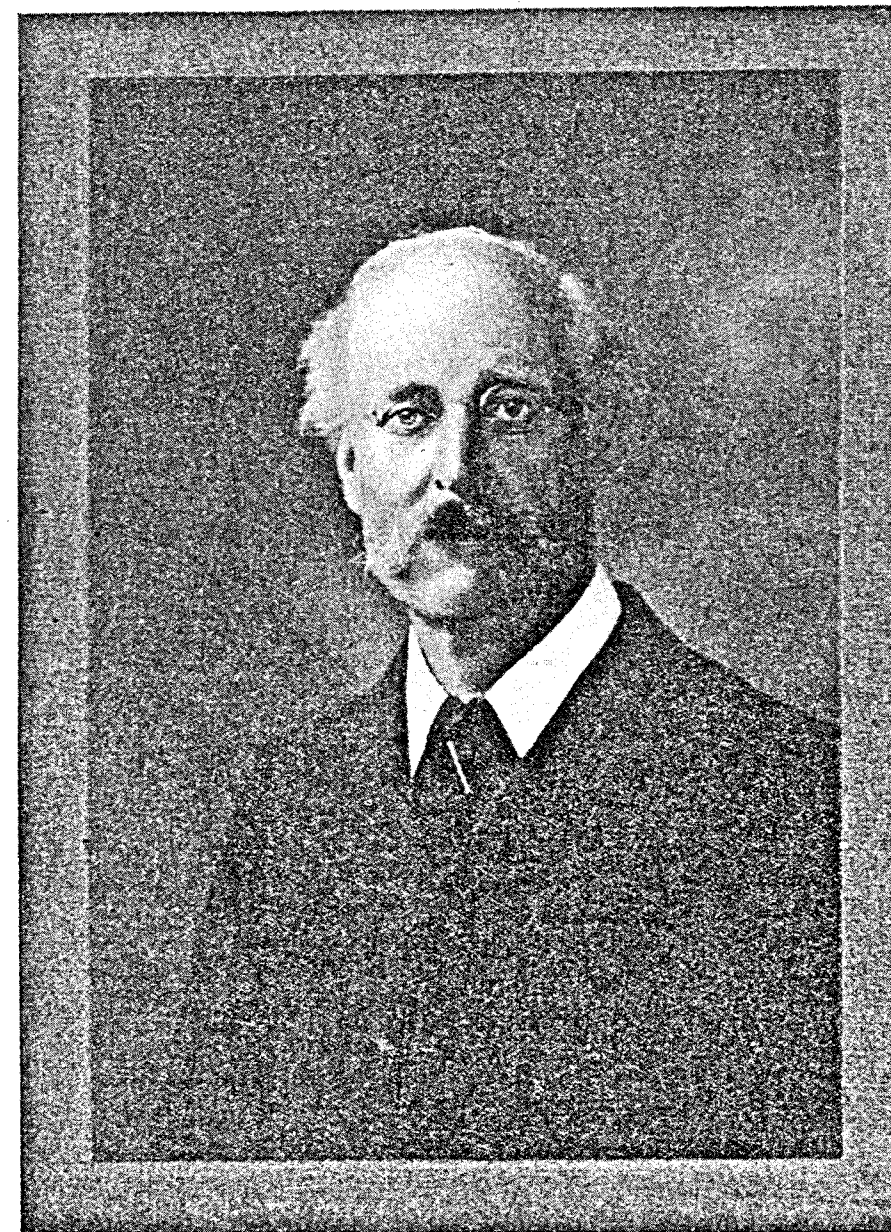
Dr. Sykes' education was in every sense a liberal one. He studied medicine in France, Germany, and Edinburgh, and his student life abroad enabled him to acquire a sound literary and conversational knowledge of French and German, and to be well versed in German scientific and general literature. In 1878 he obtained the English conjoint qualification, and the degree of M.B. at the University of Edinburgh. In 1880 he graduated B.Sc. and in 1890 M.D. at that university.

The position he had made for himself in public health work secured for him the appointment of medical officer of health of St. Pancras, the lectureship in public health at Guy's Hospital, and the Milroy lectureship. He was awarded the Howard medal of the Royal Statistical Society in 1900 for a competitive essay on "the Results of State, Municipal, and Organized Private Enterprise on the Housing of the Working Classes in London and other Large Cities." He was elected the president of the Metropolitan Branch of the Society of Medical

Officers of Health, and later of the whole society, evidence of the esteem in which his colleagues held him. Dr. Sykes' work in his district was of profound usefulness, for it provided for him ample opportunity for the exercise of his high administrative ability. He was responsible for a large improvement of the worst area in St.

weapon he could employ for the reduction of infant mortality.

In his domestic life he was entirely happy, but not long since he suffered irreparable loss in the death of his beloved wife. Dr. Sykes felt this bereavement acutely. He sought relief from an environment in which every hour



THE LATE J. F. J. SYKES, M.D., D.Sc.
President of the Society of Medical Officers of Health, Session 1904-1905.
Late Medical Officer of Health of St. Pancras.

Pancras by the application to it of the provisions of the Housing of the Working Classes Act, and as evidence of the originality which attached to his thought of administration, we may cite the institution of the school for mothers which was established in St. Pancras through his initiative, and which he saw was the best

suggested sad memories by a short tour in the Pyrenees, but he was probably already affected with the malady which eventually terminated fatally after an operation. He leaves a son and daughter, to whom the fellows and members of our society will desire to extend their sympathy.

SOME FEATURES OF THE NORWICH FLOOD (AUGUST-SEPTEMBER, 1912).

By the Medical Officer of Health.

THE storm of August 26th, accompanied as it was by an unprecedented rainfall, led, as is well-known, to the flooding of the basins of the Wensum, the Waveney, the Bure and the Yare. Included in the basin of the Wensum was a considerable area in this the most picturesque of English cities, through whose midst the Wensum winds on its way to join, on the verge of the city's boundaries, its consort the Yare. Over the conjoined river, known after conjunction as the Yare, the city exercises, by virtue of ancient charters, sanitary jurisdiction for some seventeen miles—to, in fact, Yardley Cross. At this Cross, from time to time, proclamation is made that "If there be any manner of person that will absolve, purify, implead, or prosecute any action, suit, plaint, or plea for any offence, trespass, or misdemeanor upon this His Majesty's river, let him repair unto the Rt. Worshipful Mr. (now the Rt. Hon. the Lord) Mayor, and the Worshipful the Sheriff of the City of Norwich for the redress thereof, and he shall be heard." Over all this and other areas, in Norfolk, there ranged at will an inland sea.

In the city of Norwich on Tuesday, August 27th, the Wensum rose, and with stealthy persistence continued to rise, until about dusk it implacably overflowed, and then continued its resistless rising right up to the midnight hour. Then it became and remained, for some hours, stationary, until about 6 a.m. it started as stealthily, but more slowly, to fall. The fall, like the rise, was relatively rapid, and houses that could be reached only by boat on the Tuesday night could be reached by carts on the Wednesday; and the inhabitants (living on the upper floor) fed and afforded relief.

The following figures, supplied to me by the Water Co., indicate the height and fall of flood water:

"Normal water level at intakes 10'00 above O.D.
Flood level at 12 p.m. Tues.,
August 27th 18'00 " " "
This height was maintained until 6 a.m. on Wednesday, August 28th. At 6 a.m. on Thursday, 29th, the water level dropped to 14'93 above O.D. This shows a rise of 8 feet and a drop of 3 feet in 24 hours." The water-works are just outside the city proper, where little obstruction was offered; inside the city, in places where the water was more or less dammed up and impeded, the rise was greater.

Over an area involving 2,500 dwellings, exclusive of factories, workshops, and business premises, the flood-water spread itself, and from these dwellings numbers of the inhabitants fled, and in some cases swam, or escaped in boats. In many instances, whilst older members of a family remained in occupation of the bedrooms (the lower floors being all awash with water), the children were sent away in boats, etc., to the houses of friends, or to the shelters. These shelters, for the most part, were schools or meeting-rooms attached to places of worship. Those public elementary schools which were reasonably near to the flooded districts, but themselves unaffected, were hurriedly made available as living and sleeping quarters for refugees of all ages and sexes. Fires were lighted, food in generous plenty provided, and blankets obtained to furnish some covering. With this side of the emergency work carried out by the Corporation, through its Flood Committee, except as an *ex-officio* member, I was not directly concerned. It was admirably organised. Nor is it needful for me to recount the heroic, the tragic, and the comic incidents which characterised this never-to-be-forgotten flood. In place thereof I will give a brief abstract and chronicle of the emergency work which fell to the lot of the public health department.

At the first meeting of the Flood Committee I was invited to take command of all State and other medical measures that might be needed to meet the emergency, and was constituted a sub-committee sole, given a free hand, and accorded full authority to engage such help as I deemed necessary, and to take such administrative measure as seemed desirable—to myself. I accepted this responsibility the more readily because it was so untrammelled.

In over a score of shelters there were collected, in numbers, varying from scores to hundreds, refugees with nothing but what they had upon their persons. It was necessary immediately to establish an organized service. I knew that if I made proclamation of my wants I should get scores, probably hundreds, of, for the most part untrained, however willing, helpers. I knew also that, in the circumstances, I should be pretty certain to get confusion, and be fortunate if I escaped chaos. I went direct from the committee to the Officer Commanding the 2nd East Anglian Field Ambulance (Lt.-Col. Stacy) and secured his help; all the more readily because I am myself attached to the R.A.M.C. (T), as a Major in the sanitary service. Within three

hours he had mobilized his men, and detachments varying from four to sixteen in number with stretchers, etc., had been sent to the shelters. At these shelters class-rooms were converted into temporary hospitals, and in these many scores of temporary illnesses, fits, faintings, bruises, and minor injuries were treated; the more serious cases being transferred to the hospitals and the Union Infirmary. To secure relays of doctors, on call, night and day, was easy; the members of the medical profession proffered their gratuitous services so readily. They responded to the calls made upon them with great generosity. I added easily such women nurses, amateur and professional, as the circumstances called for, and was thus enabled to establish a working, and, as experience proved, an efficient organisation practically immediately. I made rounds of all the shelters at night, and also in the mornings, and was thus enabled to keep in touch with everything. As in private duty bound, I must here make special mention of the invaluable aid given by my two assistants, W. L. Goldie, F.R.C.S., and Jno. Allen, M.B., the former and senior of whom, who fortunately for me, was in the city from the outset, helped most assiduously, as did the latter directly he got back from his holiday. These two officers took charge during the latter portion of what I will call the shelter period (the last refugee left on October 3rd) of the schools, used on either side of the river, one taking the north, and the other the south bank shelters. The health visitors (4) paid daily visits to the shelters and were very helpful in getting babies properly fed and tended, children bathed, heads cleaned, etc., etc. It is not possible definitely to say how many people were in the shelters the first (Tuesday) night—the men in charge estimated the number at 3,000—a number of the adults finding that the flood was subsiding went back to their homes next morning, the bedrooms being usable, and left their children in the shelters; but on the Wednesday night there were well over 2,000, and September 11th (sixteen days after the flood), a special computation showed that there were then 1,393 at all ages—but children chiefly. As the number of refugees lessened, the less satisfactory shelters were closed, and their inmates transferred to the better ones, or new ones were opened. In the latter part of the time, elementary schools alone were used, and their division into class-rooms enabled not only the sexes, but also the children, to be separated; whilst the central halls provided excellent feeding places. In these also,

concerts were held and entertainments given, and a quite delightful amount of kindness exhibited. Norwich, in fact, rose to and satisfied every requisition of the situation. She very properly can be proud of her citizens.

So much said upon the general features of the special flood medical work. I now suitably can condescend upon a few particulars, *e.g.* infectious disease in the shelters. Three cases of measles were removed (these obviously had contracted the ailment prior to the flood), two of diphtheria, and three of tonsillitis—a record that can, I think, fairly be classed as remarkable.

Other ailments: Five persons were removed to the Norfolk and Norwich Hospital; five to the Jenny Lind Infirmary, and 44 to the Union Infirmary. Two of the N. and N. hospital cases proved to be hysteria, one endometritis, one necrosis of the tibia, and one purulent synovitis, the hysteria alone being attributed to the flood. The Jenny Lind Infirmary cases were one of catarrhal laryngitis, one of bronchitis, and three of intestinal trouble, doubtless due to altered diet. The Union Infirmary cases were ten of acute coryza, six of bronchitis, three debility, three pregnancy, three of lumbago, and one each of hydrocephalus, fractured fibula, eczema, gastritis, hemiplegia, impetigo, vaginitis, onychia, and acute conjunctivitis. The reader will decide for himself those of the above ailments which reasonably can be attributed to the flood.

Effect of flood upon notification of infectious disease:—This easily can be gauged from the following figures for the whole city for the ten weeks from August 24th to November 2nd, inclusive.

Week ending	Diph- theria.	Scarlet Fever.	Enteric Fever.	Ery- sipelas.
Aug. 31st ..	7	8	2	5
Sept. 7th ..	5	3	2	1
Sept. 14th ..	5	8	0	1
Sept. 21st ..	5	8	2	4
Sept. 28th ..	6	3	0	2
Oct. 5th ..	3	1	1	5
Oct. 12th ..	6	6	1	2
Oct. 19th ..	7	3	1	1
Oct. 26th ..	2	5	0	2
Nov. 2nd ..	3	3	0	1
	49	48	9	24

Out of the above, 12 cases of diphtheria, 10 of scarlet fever, and 8 of erysipelas occurred during the 10 weeks among the inhabitants of the flooded area. Not a single one of the enterics originated there (3 of the 9 were contracted outside the city). When it is remembered that the flooded area includes within its boundaries much of the worst property and of our poorest folk, the foregoing figures, representative of the incidence of disease among at least 12,500 people, cannot be deemed other

than as satisfactory. The flood, in fact, does not so far appear to have affected the incidence of infectious disease in this special area unfavourably. (I have asked the members of the local medical profession to take note of the amount of rheumatic fever, etc., they may find, and let me have the returns at the end of this year. So far as I can learn at present, there has been very little.)

GROSS DEATH RATES FOR THE WHOLE CITY FOR THE SAME PERIOD.

Week ending August 31st, ..	10.6	for population at all ages.
Sept. 7th ..	13.5	" " "
Sept. 14th ..	7.7	" " "
Sept. 21st ..	6.9	" " "
Sept. 28th ..	11.0	" " "
Oct. 5th ..	10.6	" " "
Oct. 12th ..	10.6	" " "
Oct. 19th ..	11.4	" " "
Oct. 26th ..	8.6	" " "
Nov. 2nd ..	10.6	" " "

Or for the total period of 10 weeks an average death-rate of 10.6 per 1,000.

The inferences I draw from the above figures, together with certain sage reflections upon the influence of the flood, and some particulars of other work carried out, or being carried out, or contemplated by my Department, especially with reference to houses and housing problems, I hope to give in a subsequent paper.

H. C. P.

DR. McVAIL'S LAST REPORT TO THE COUNTY COUNCIL OF STIRLING.—In submitting his twenty-first annual report to the County Council of Stirling for the year 1911, Dr. McVail bids farewell to the County Council of Stirling, the occasion being his appointment to the deputy-chairmanship of the Scottish Health Insurance Commissioners. During the whole of the twenty-one years he held the position of medical officer of health in the county his relations with the council seem to have been of the most friendly, and he takes leave of them with expressions of most sincere regret. In addition to giving the ordinary statistical and other information with regard to the work of the year in the county and each of the three districts—central, western, and eastern—Dr. McVail includes a number of most interesting special reports submitted to the various councils. Amongst these may be specially noted one on "Rivers Pollution," another on "The Housing, Town-Planning, etc., Act, 1909," and a third on "An Outbreak of Enteric Fever." In commenting upon the infantile mortality ratio of the various districts, Dr. McVail makes a special note of the fact that at the end of 1911 none of the district committees had adopted the "Notification of Births Act, 1907."

THE PHYSIOLOGICAL BASIS OF THE CLAIMS FOR FRESH AIR AND VENTILATION.*

By LEONARD HILL, M.B., F.R.S.,
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London Hospital.

IT has been generally supposed that the ill effects of close and crowded places are due to chemical impurity of the air, contaminated by exhalations of human beings and impoverished of oxygen. The language by which the public expresses its feelings does not support this view. When people complain in theatres, ball-rooms, meetings, etc., they say how close and warm it is, there is not a breath of air, let us go out and get cool, the ladies use fans, and men and women put on light evening wear to attend society functions, theatres, balls, dinners, etc., all of which goes to show that the conditions of temperature, not chemical purity, are at the bottom of any troubles.

Physiological experiment has shown without question that the percentage of CO₂ in the air breathed in crowded rooms has nothing to do with the discomfort felt. The breathing is regulated by the partial pressure of CO₂ (or percentage reckoned at 0°C and 760 mm) in the alveolar air of the lungs. The normal partial pressure therein is 5.6 per cent. of an atmosphere. If we breathe an atmosphere containing, say, 1 per cent. CO₂, all that happens is that the breathing is slightly deepened, so as to increase the pulmonary ventilation and maintain the normal concentration of CO₂ in the lungs. Exactly the same thing happens when we take exercise and produce more CO₂ in the body. The excess of CO₂ in the atmosphere cannot then influence the body otherwise than by slightly increasing the pulmonary ventilation. In the most crowded places the percentage of CO₂ never rises to 1.

At every breath we breathe back into our lungs the expired air which occupies the larger air passages, and thus habitually inspire air contaminated with exhaled air. The volume of the dead space, *i.e.*, of the larger respiratory air passages, is about 1.40 c.c., thus if we breathe in 500 c.c., more than one quarter of this amount is exhaled air, this fact alone suffices to show not only that there is no chemical poison in exhaled air, but that no harm can result from a diminution in the concentration of oxygen such as occurs in crowded ill-ventilated rooms; this diminution

* A portion of an address given to the recent London County Council Congress of Teachers is incorporated in this article.

never exceeds 1 per cent. of an atmosphere. In the pulmonary air the partial pressure of oxygen is normally 13.14 per cent. of an atmosphere, and it makes no difference to the breathing or comfort of a normal man at rest if the oxygen in the atmosphere is reduced from 21 to 13 per cent. of an atmosphere. In the Alpine health resorts at lofty altitudes of 4,000 to 5,000 feet, the air is attenuated, and the partial pressure of oxygen there is far lower than in the worst ventilated and crowded room. In the lofty plateaus of the Andes there are cities, railways, mines, etc., at altitudes of 10,000-15,000 feet, where the oxygen partial pressure in the higher parts is even less than 13.14 per cent. of an atmosphere. Mountain sickness may affect the new comers to such altitudes until acclimatised to the diminished partial pressure of oxygen, but the mechanisms of the body are such as to secure a sufficiency of oxygen even in such conditions. The affinity of hæmoglobin for oxygen may be altered by varying the concentration of acid in the blood, while the partial pressure of CO₂ in the lung may be lowered, and that of oxygen kept up by increased pulmonary ventilation; the amount of hæmoglobin and number of red corpuscles is increased and the blood circulated with greater rapidity. These changes, brought about by high altitudes, together with the effects produced by cool air and sunlight on the nervous system, lead to increased vigour and health of the body, hence the reputation of mountain health resorts. It is only continued residence in excessively high altitudes which lessens the health. We may then dismiss the partial pressure of oxygen as having nothing to do with the ill effects which result from confinement in close rooms, or good effects which result from open air. Much has been made of the supposed existence of a chemical organic poison in exhaled air. The fact already stated that we habitually breathe a part of our own exhaled air is against this supposition, for at each breath we breathe in far more exhaled air from our own larger air passages than we do from the air in the worst ventilated room.

It may be suggested that the poison comes from others and not from ourselves. Against this is to be put the fact that animals like mice, rats, rabbits and pigs huddle up together for warmth's sake in confined places and breathe air contaminated with each other's breath. Dr. Martin Flack and I have kept rats in confined sleeping places provided with a narrow exit, and found so long as it is not

too hot they prefer to sleep in air containing 3-4 per cent. CO₂ rather than come outside. If the sleeping chamber becomes excessively warm and moist they come outside. We have kept guinea-pigs and rats together for many weeks in boxes so ill-ventilated that the CO₂ in the confined atmosphere averaged about 1 per cent. They have breathed each other's breath, and yet have grown, and put on weight. We have tested the guinea-pigs by the anaphylaxis reaction, to see whether any foreign (rat's) protein had been directly absorbed into the blood from the air inhaled. The injection of rat's serum into the vein of the ear of the guinea-pigs was without result. This showed that no rat's protein had been so absorbed. A second most minute dose of rat's serum, injected a month later, killed the guinea-pigs at once.

The experiments by which Brown Sequard claimed to have demonstrated the organic poison, have been repeated by many skilled and trustworthy researchers, and with wholly negative results. The condensation water obtained from exhaled air has been injected by the very few, who claim to have obtained positive results, in absurd doses, *e.g.*, 1 gramme into a mouse weighing 13 grammes. This is equivalent to injecting 5 kilogrammes of water into a man weighing 65 kilogrammes! Quite a small amount of distilled water, contaminated by bacteria, may of itself produce toxic results when injected intravenously. The toxic effect may be obtained even when such water is sterilised by heat. Careful examination of the literature has shown me that there is no proof, worthy of credence, of the existence of an organic chemical poison in exhaled air.

Bacterial infection, on the other hand, is enormously increased in confined atmospheres crowded with people. The air on mountain tops or on the sea fifty miles from land is almost sterile, while thirty colonies may result from the passage over a culture plate of 1 litre of air taken from the debating chamber of the House of Commons, and 300 colonies from a litre of air taken from an old and not very well cleaned schoolroom. The exhaled air of a man who is quietly breathing is sterile, for the inhaled organisms are filtered off by the respiratory tract. Air explosively exhaled, as in sneezing, coughing and speaking, disseminates droplets of saliva yards around, and each of these droplets may carry many bacteria. It is highly probable that direct infection by

saliva spray is the cause of colds and influenza, of pneumonia and pulmonary tuberculosis. Massive infection is thus produced with organisms, whose virility is unimpaired by exposure to outside conditions. My colleague, Dr. William Bulloch, tells me that out of nearly 800 cases of pulmonary tuberculosis, bacteriologically investigated by skilled observers in various laboratories, in all except three the bacilli were of the human type, only two were clearly of bovine type. Direct infection from man to man by exhaled spray is probably of infinitely greater importance than infection by sputum spat out and dried into dust. Dr. Bulloch has drawn my attention to cases of people with very little signs of illness and carrying on the ordinary business of life, whose sputum teemed in every droplet with tubercle bacilli. Such people must disseminate the bacilli through a crowded railway carriage or room when speaking or coughing. The same holds good for influenza. Infection becomes massive when chill, moist weather drives us into artificially heated and closed rooms. Such massive spray infection is avoided by those who live an open-air life, while their immunity to infection is raised. Observations made by Dr. Muecke and myself show that the mucous membrane of the nose and throat, like the skin, becomes swollen (in warm atmospheres), flushed with blood and covered with abundant secretion. On passing into a cold atmosphere the blood vessels shrink, the mucous membrane remaining swollen. The increased secretion and tissue lymph may form a nidus for the development of bacteria which massively infect the swollen nose during the confinement in a crowded, warm atmosphere. The constriction of the blood vessels in the cold atmosphere deprives the swollen mucous membrane of the immunising power of the blood. In those who live in the open-air the nose does not swell and flush, but remains firm, cool and taut, and the blood circulating through it and the action of the ciliated epithelium, prevent bacterial growth.

In the summer windows are open, and the less confined, cool, moving air lessens the spray infection, while the mucous membrane is not suddenly submitted to cold, raw air, after exposure to the heated atmosphere of our rooms as in winter. Since we must go into crowded rooms, and artificially heat these rooms in winter, it behoves us to lessen spray infection as far as possible. To effect this, people in the acute stage of an influenza or coryza, must

cough and sneeze into a handkerchief. They could be taught to talk with a newspaper held in front of their mouth, or he who talks to them can protect himself in this way. If we see one in a railway carriage with all the signs of an acute cold in the head, we can protect ourselves by holding a newspaper curved in front of our face. The spray sneezed, coughed, or spoken out will stick to the paper. By teaching the modes of infection and training the habits of people the spread of spray infection may be greatly diminished, and by the simplest means.

The recent discovery of the Sussex skull with its Simian characteristics strengthens the conviction that man goes back to Pliocene times, and that a million or two years have passed in the course of his evolution. Throughout this immense span of time he has battled with the forces of nature and his bodily structure and function have been evolved to meet these forces. Hence, the adequate give-and-take stimulus and reaction between these forces and those of his living body now result in vigour, health, and happiness. Too much shielding from the struggle with Nature, over-coddling, must inevitably lead to an atrophy from disuse of those nervous and muscular powers evolved to withstand the struggle, and this deprives the individual of the intense enjoyment of life which is the heritage of every wild animal, so long as it remains in perfect health, unbeaten and using every sense and power in the fight for life amidst its natural environment. If we wish to promote the hygiene of modern man, living a City life, we must not accept without question the fashions of the day, the methods of upbringing and modes of life imprinted on us by recently established custom, and the current teaching of the nursery and school.

The hygienist must use the historical and evolutionary method, and think back to those past ages when man struggled exposed to all weathers, hardened his body to the blast, and endured, alternately, repletion or surfeit, the sun's warmth or the chill sleet of winter.

The body of man innured to it by upbringing can stand cold no less well than an ox or an ass which browse in the winter fields. Darwin, visiting Terra del Fuego, describes a mother and babe greased with fish oil, but otherwise naked, standing in the sleet. Sailors and fishermen, Arctic hunters, mountaineers endure exposure to cold with impunity, and so long as they avoid the habitations of man, never suffer from colds or influenza. Even the coddled well-to-do citizen who survives the

chilly exposure of a shipwreck, such as the "Titanic" disaster, does not suffer from the ills commonly attributed to cold.

A man, exposed too much, may die of cold from actual chilling of his body and cessation of function, but if he survives we do not find, consequently, that he falls a victim to pneumonia, influenza, or even a cold in the head.

Undoubtedly, the power of man to withstand and survive exposure to cold is very great, and infective disease is not due to cold.

The Arctic travellers of Shackleton's expedition were untroubled by cold or influenza until they opened a bundle of clothing which had been packed in London.

Fishermen, so long as they live and work in open boats and stoveless sheds, suffer little from tuberculosis, whilst those in Norway and Labrador who have recently taken to the close heated cabins of motor boats and stove-heated shanties suffer greatly.

"Colds," influenza, pneumonia, tuberculosis, result not from exposure to cold, but because the discomfort of chill and wet weather drive mankind indoors into over-heated, windless-rooms, where our immunity to infection is lowered and the mass influence of the infecting bacteria is enormously increased, where, too, the heated atmosphere may preserve the virulence of the pathogenic bacteria, during the transit from one to another. In the summer holidays when exposed to bracing sea winds and paddling half the day, children do not catch cold, however cold and boisterous the weather may be, but so soon as they return to school, to chill October days and close warm rooms, infection runs around. Where the schools are conducted in the open-air, in suitable sheds with open sides and movable wind protectors and the children are well-fed and rested, warmly clad, at short intervals exercised and kept warm by natural body-heat, and are not allowed to go into over-heated and close atmosphere of places of worship or amusement, there the epidemics do not occur and children grow and thrive wonderfully. We put down most of our ills to chill, and the very word "cold" expresses the current belief that the catarrh of the nasal mucous membrane is due to cold. The medical profession, unfortunately, supported this belief, and the age of curtained four-poster beds and sealed windows held sway until the recent open-air crusade was started.

Damp beds, wet foot-gear, exposure to rain, night air, etc., are regarded as most dangerous

by nurses and mothers. The lore of the nursery has prepotent sway in the land and yet it is as unsupported by scientific evidence as the old beliefs of the alchemist or witchcraft. Wild and domestic animals puddle about in damp places, endure damp feet and fur, couch themselves to rest in damp litter. Sailors turn into their bunks with damp clothes, soldiers sleep in damp tents and march wet with rain. Thousands of our citizen soldiers—the Territorials—endured a chill wet fortnight in camp last summer, and came scatheless through it, so far as concerns the illness generally attributed to cold. The evidence is overwhelming that man can stand with impunity damp and cold so long as he is well fed, rested, and exercised.

On the other hand, the proof of the harmful effects of over-heated, moist, or excessively dry atmospheres is abundant and incontrovertible. Man likes to ascribe the cause of his illness to some mysterious essence, and refuses to admit the harmfulness of that which gives him at the moment pleasure and comfort, over-warmth and a surfeit of food. In the days of his struggle through the ages of evolution he rarely got either warmth or a feast, and it was good for his economy to make the most of both when they came his way. Now, with all the resources of civilization and wealth at his disposal, man can generally command both every day and all day.

It is obvious to anyone who has kept a pony, that if kept in a stable and allowed to eat all day, it will grow fat and pot-bellied, its skin will be full of "humours," and its wind broken and capacity for long continued effort destroyed. Hard exercise and a spare diet will restore both its form and vigour. Pigs kept in a sty and with full trough grow so fat and gross that they cannot even be driven to market. None-the-less, with such object lessons before him, the business man often shirks all open-air exercise, lives and works in too warm rooms, and feeds too often and too well. Work and amusement, under the strained conditions of City life, often produce nervous exhaustion, and this leads to a failure in the perfect function of the digestive mechanism through which the blood is not adequately circulated owing to the long hours of sedentary occupation in warm atmospheres. When the nervous and muscular energy of the bowels are diminished, bacterial fermentation gets out of hand, and bilious attacks, dyspepsia, appendicitis, caries of the teeth, etc., result. Often the

appetite becomes fanciful and the wrong foods are taken—pickles, tea, alcohol, etc., are excessively indulged in. Hypersensitivity to the sensory impulses which arise in the viscera not infrequently ensues. Monotony of external conditions leads to an exaltation of the attention towards the sensations which arise from within the body.

Women who neglect open-air exercise and muscular development lose their freshness of complexion and beauty of figure and fail to secure that happy married state which satisfies the bodily health by maternity. The falling down of the womb and accompanying neurotic troubles are associated with lack of development of the abdominal muscles, and particularly those of the pelvic floor. The savage woman, no less the field labourer in Eastern Germany, bears her child and returns to her labours with impunity after a few hours' rest.

For all these ills open-air exercise with exposure to wind and sun, adequate rest and a wisely-regulated diet are the sovereign preventives.

The danger of a draught is a household doctrine, a part of the creed of modern man. The slightest feeling of cold air on a bald pate leads to the demand for close of the windows of a railway carriage, and yet when business men are kept perhaps for two hours chilled in fog-bound trains, we do not find them suffering from an epidemic of "colds," etc. When we are confined to a hot atmosphere, and have our body-heat regulating mechanism, and our clothes set for these conditions, a current of cold air striking some particular part of the body produces a feeling of cold which is uncomfortable, for the skin is then warm and full of blood, not cold and pale as it is when the mechanism is set to withstand cold. Should we close the source of cold air when an extra wrap or a hat will prevent the discomfort? Do we not use cool, moist, fomentations, ice, etc., applied locally and with good result, while the rest of the body is kept warm?

One like myself, who has been through the open-air treatment, rejoices in the cool play of air, has no fear of draught or cold, and avoids like poison the hot, close air of confined and crowded places. I see in the mind's eye the innumerable hosts of infective bacteria carried abroad in the invisible droplets of saliva which are sneezed, coughed and spoken out by the crowd. I picture the swollen condition of the nasal mucous membrane and that of the throat, and probably of all the respiratory tract produced

by the over-warm moist atmosphere—a suitable nidus for the bacteria. Why, then, is it generally believed that a chill is the cause of a "cold in the head"?

The reasons for this belief lie, first, in the fact that warmth is comfortable and cold is not; secondly, that when infected with a "cold" or influenza we feel cold. Our heat-regulating mechanism is disordered by the slight catarrhal fever, and Nature then warns us to husband our energies in some sheltered, warm spot and so aid the fight against the invading organism. To fight such infection once established, vaso-dilatation and the active phagocytic action of the white blood corpuscles must be promoted, and hence the infected one is warned by his feelings and seeks warmth. But it is not cold which has caused the "cold in the head," but exposure to infection in a close, warm room, crowded with people. To carry out sedentary work in comfort during the winter we require artificial heat so that we may not have to keep up our body-heat by exercise. The repose of the body during the long hours of such work reduces the muscular metabolism, the ventilation of the lungs and intake of oxygen, the combustion of food stuffs and the efficiency of the circulation of the blood.

The circulation of the blood is so contrived that while it is the business of the heart to deliver the blood to the capillaries, it is the part of the muscles, skeletal and visceral, to return the blood and tissue lymph back to the heart, by their pumping action, contraction and relaxation, and constant change of bodily posture which brings the force of gravity into play. The sedentary worker employed in a warm room does not require to move to keep himself warm, and thus the vigour of his circulation languishes. He does not require much oxygen and has not to expel much carbon dioxide, and thus his respiration is shallow.

The respiratory mechanism gives a most effectual aid to the circulation of the blood, particularly to the circulation through the liver and other abdominal organs, and through the lungs. The lungs of the sedentary worker are not well expanded and ventilated in all their parts, neither does the blood with its immunising powers, sweep in ample stream through all parts of the respiratory tract. Hence, in every way the sedentary worker reduces his immunity to infection. His blood is not so well circulated, the absorption of food stuffs is not so great, and thus the rarer principles may be not obtained in sufficient quantity, especially

in these days, when natural foods are robbed of vital principles by processes of milling, sterilization and canning. The perverted appetite, too, of the nervously-exhausted worker leads to ill-nutrition. Moreover, the blood of a man exposed to an over-warm atmosphere is brought in greater volume to his skin, and a less ample flow is set through his viscera, his skin is wet with sweat and raised in temperature. The cool, changing stimulus of wind playing on the skin promotes the vigorous tone of the nervous system. It drives the blood and tissue fluid away from the skin and sends the blood through the viscera in increased volume.

How it tones up and hardens the involuntary muscle is shown by the constriction of the cutaneous vessels and contraction of the bladder and consequent need to make water, which follows exposure to a cold bath or wind. Exposure to cold tones up, hardens, and makes vigorous the whole man, while warmth relaxes and enervates him and brings all his functions to a lower level as a producer of energy—heat and movement. It is right that we should alternate from one to the other, seek rest and sleep in warm sheltered surroundings and do work exposed to all weathers strenuously in the face of Nature's onslaughts.

The sedentary worker tends to reduce his condition all the time to that resting state, and a habit of monotonous life wholly contrary to the evolution of man. Sheltered from wind and sun, in artificially lit, airless, over-heated places, he sleeps, eats, travels and works, respectively, in the tenement or flat, the restaurant, the tube railway, the factory or shop.

The confined airless atmosphere, the monotony of work, the lack of facility for open-air sports, impel the young to excessive indulgence in smoking, tea or coffee drinking, alcohol, to the excitement of betting and amusements, in their off hours in hot confined places, cinema shows, music halls, etc. The churches and chapels preach morality, while the present mode of City business life reduces the health of the body on which vigour of character and strength of mind depends. Let us, then, further the promotion of playing-fields and open-air games, citizen soldiery and drill, swimming baths (open winter and summer), and sunlit and well-ventilated dwellings and places of work, and improvement in national health and character will assuredly follow.

Lofty houses break the force of the wind and hide the light of the sun. The sky, too, is

blackened with soot—the squandered treasure of the nation. The City worker is penned in cellars or places far removed from daylight. Look into any coffee house at mid-day or into the third-class carriages of the suburban trains in the evening, and note the young men and women who are pale, listless, poorly developed, and how many are ruddy with health, joyous with good spirits, as are the boys and girls of a well-managed and disciplined institution? We have extended in recent years the average duration of life by better hygienic management of the infant and child. We have not extended the age or increased the health and happiness of the later period of life. There is a depth of ignorance abroad as to the fundamental laws of health, and conditions of life are tolerated—even pass unquestioned—which make this age a dark age, not one of enlightenment—except to the few.

PATENT MEDICINES.—The mining villages are much preyed upon by hawkers of clap-trap rubbish—often sold upon the instalment system. The patent medicine pedlar does a great deal of harm, and large sums of money are wasted by credulous poor people on worthless remedies, glibly warranted to cure every disease under the sun. "Consumption cures," a liniment for hernia, blue spectacles for blepharitis, and soap at a shilling a small tablet to cure skin diseases, generally scabies, are some samples of this class of trade.—*Durham County Council. Annual Report of the School Medical Officer, 1911.*

A HEALTH RECORD.—At a recent meeting of the Town Council of the ancient Borough of Pwllheli (whose Municipal Charter dates back to the days of the Black Prince), some remarkable figures were submitted with reference to the health of the town. During the month of December the death rate was only 6.31 per 1000. There were no cases of infant mortality. During the year 1912 the death rate was 9.45 per 1000 as compared with 13.4, the lowest record for England and Wales. The following comparative table was submitted:—

1877-88	Death Rate	21.7 per 1000
1895-1904	"	18.3 " "
1905-12	"	17.05 " "
1912	"	9.45 " "

The town was entirely free from notifiable infectious diseases during 1912. The town has greatly increased in public favour as a health and pleasure (sea-side) resort during recent years, and is establishing a reputation as a winter resort. Its health-giving properties are attested by the foregoing figures. A large proportion of the dwellings are very old, and a high percentage of the population represents old people.

EXHAUST VENTILATION IN THE REMOVAL OF DUST AND FUMES.

By T. M. LEGGE, M.D., D.P.H., H.M. Medical Inspector of Factories.

THE following interesting lecture, "Exhaust Ventilation in the Removal of Dust and Fumes," which was illustrated by a series of beautiful lantern slides, was delivered by Dr. Legge at the Rooms of the Society of Medical Officers of Health on 20th January, 1913. He made no apology for treating a subject on which he was not an expert because the subject of Exhaust Ventilation was as closely related to factory hygiene as sanitary engineering was to public health. Pictures were then shown on the screen of different kinds of dust, the lecturer pointing out that they appeared very much alike and that unless the chemical constitution of the dust was known, they conveyed little information of value. One was a photo of granite dust, representing particles of silica, felspar, or mica. Another showed the exceedingly fine dust of cement, almost innocuous as far as they knew, although there was no more dusty place than a cement factory. Another dust shown, closely resembling cement dust microscopically, was that from basic slag, which was distinctly injurious. In the next was sandstone dust, extremely injurious on account of the silica it contained. The more the subject was enquired into, the more it came out that it was really the amount of free silica in a stone or dust which determined its harmful character. In towns like Bristol, where the stones worked by masons are mainly limestone and Portland stone, the percentage of deaths from phthisis in the average adult male population was about 12, and that of masons was practically the same. But if they went to Manchester, Newcastle and the Yorkshire towns, where the stones were mainly free-stone, sandstone and grit-stones, the average percentage of deaths in the same class from phthisis was about 17, and that of stonemasons between 50 and 60. Opinion was coming round to the view (especially that of his colleague, Dr. E. L. Collis, who had paid much attention to the subject) that the difference was probably due to the free silica in the dust. The next picture was a silicious dust used in the Potteries. It certainly had the feature of very sharp points, and it was pure silica. This fact seemed to lend truth to the generalization which had been made by Dr. Aldridge, that those dusts were particularly injurious which were foreign to the material entering

into the constitution of the body. Coal dust is carbon, of which so much of the body was made up, and it was not so injurious as silica, which was foreign to the body. The next picture showed flax dust, which illustrated the fact that with irritating dust of vegetable origin respiratory disease, such as chronic bronchitis, rather than fibroid phthisis resulted. After exhibiting pictures of hemp and cotton dust, the lecturer went on to show by means of a series of slides the way in which the dust was collected in and carried out of the workshops.

Nearly all the work done in estimating the amount of dust present in the atmosphere of factories in this country had been done by H.M. Inspector of Factories, Mr. G. Elmhirst Duckering, of Birmingham. He had devised the apparatus and had made all the determinations. The apparatus consisted of (1) a filter, by means of which dust is separated from the air and collected in a form convenient for subsequent manipulation; (2) an aspirator, calibrated so as to measure automatically the volume of air aspirated, for causing air to pass through the filter; and (3) the necessary supports, etc., for the filter.

A determination can be made of any particular sample of dust in fifteen minutes. It was necessary to have some standard to which all estimates were reduced; and milligrammes per 10 cubic metres of the air aspirated was adopted. Mr. Duckering's investigations had thrown much light on the point of lead fume present in the air of a tinning workshop, and the amount of lead in the dust in the air during certain pottery processes, and the process of sand-papering after painting. Incidentally, also, they helped to determine the minimum daily dose of lead which would set up chronic lead poisoning. Aspirating the air at about the level of the worker's mouth for varying periods of time, he determined the amount of lead in the fume, or of lead in the dust, per 10 cubic metres of air, and from knowledge of the time during which inhalation took place, he calculated the approximate quantity inhaled by each worker daily.

Experiments carried out on factory premises gave results as to the relative danger from lead, to (a) a tinner using an open bath; (b) a tinner working at a bath provided with a hood and exhaust by means of a furnace flue; and (c) the nature and extent of air contamination caused by the operation of wiping the excess of metal (while still in a molten state) from the tinned article.

A tinner dipping the article in an open bath breathes 37.79 milligrammes of lead per 10 cubic metres of air, which was equivalent to 10.7 milligrammes of lead inhaled by the worker per day. When the bath was covered with a hood, and the fumes exhausted by the

10 cubic metres of air was 2.12 milligrammes, and the quantity of lead inhaled by the worker per day was 0.83. In the course of removing superfluous glaze the average amount of lead present in 10 cubic metres of air was 2.2 milligrammes, but in some cases where the exhaust

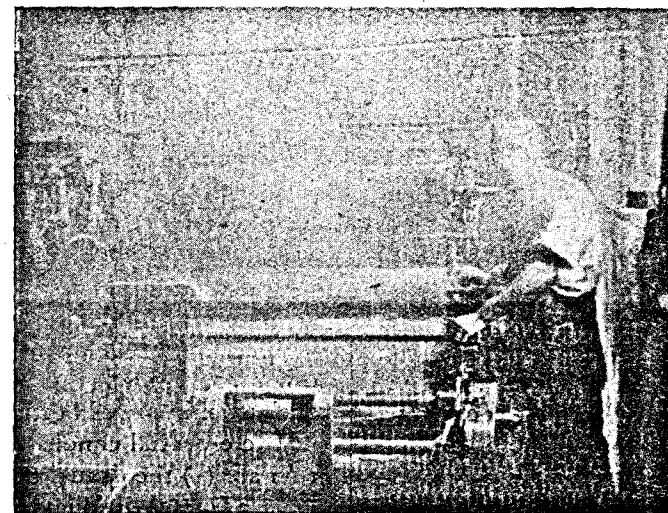


FIG. 1. A DUST CLOUD FROM A CARDING MACHINE, WITHOUT DUST EXTRACTOR. See page 174.

draught of a furnace, that amount was reduced to 6.36 milligrammes of lead per 10 cubic metres of air, or 1.8 inhaled by the worker per day. But when the tinner wiped off the excess of the mixture of tin and lead without any

ventilation was defective, it amounted to 13.34 milligrammes. In coach-painting the proportion of lead found by Duckering in the air breathed during the actual time of sand-papering explained the severe incidence of poisoning

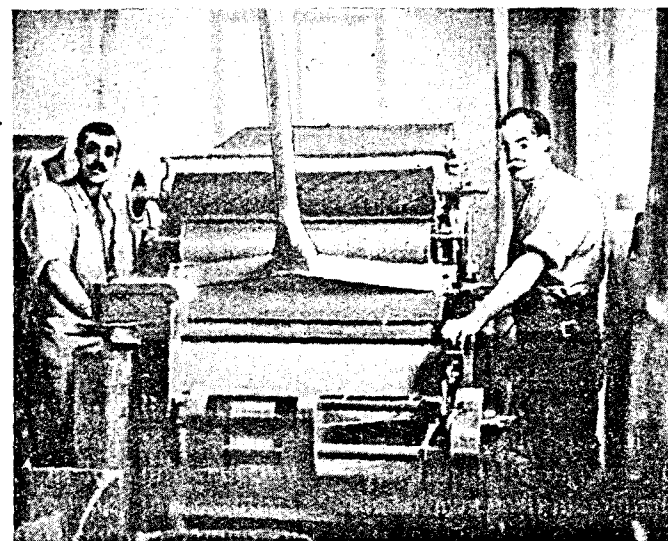


FIG. 2. THE SAME MACHINE WITH DUST EXTRACTOR. See page 174.

exhaust, the amount of lead present in 10 cubic metres of air was 124.31 milligrammes, equivalent to 35.2 milligrammes of lead inhaled by the worker per day. Carrying on exactly the same procedure in pottery dipping the average amount of lead in the dust present in

in this class of work. The lead contained in the dust, inhaled into the lungs, was, in many cases, much in excess of the amount found in the air, when wiping off in the tinning of hollow-ware. In one case Duckering found 278 milligrammes of lead in 10 cubic metres of air,

and in another as much as 1025.

From these results, and knowing intimately the processes at which the estimations were made, the relative frequency of cases of plumbism reported among those employed at them, and the duration of employment prior to attack, there was justification for saying that, if the amount of lead present in the air breathed, contained less than 5 milligrammes per 10 cubic metres of air, cases of encephalopathy and paralysis would never, and cases of colic very rarely, occur.

And this figure was quite a practical one in any process amenable to locally applied exhaust ventilation. If 5 milligrammes were the limit it seemed impossible that any coach painter could be saved. Somewhere about 2 milligrammes, or 0.002 gramme of lead he regarded as the lowest daily dose, which, inhaled as fume or dust in the air, might, in the course of years, set up chronic plumbism. The work of sand-papering was, however, very rarely continuous, the time occupied in it being, for the painter, about one or two hours daily; for the brush hand, two to three-and-a-half hours; and for the painter's labourer, four to five hours.

According to Duckering's experiments the following table shows the effect of exhaust ventilation in workrooms in arresting dust:—

TABLE I.
Amount of Dust in the Air of Workrooms at Breathing Level. (Milligrammes per 10 cubic metres of air).

Process.	Without Exhaust.	With Exhaust.
Dry grinding	768	—
Wet grinding	50	—
Flat glazing	647	80
Finishing	203	36
Pressing tiles	604	163
Fettling tiles	1609	88
Towing earthenware	627	36
Flat knocking	5863	79

The effect of exhaust ventilation in improving the conditions in lead industries was brought out in another table showing the cases of lead poisoning reported in 1899, 1904, and 1912 respectively.

TABLE II.
Reported Cases of Lead Poisoning.

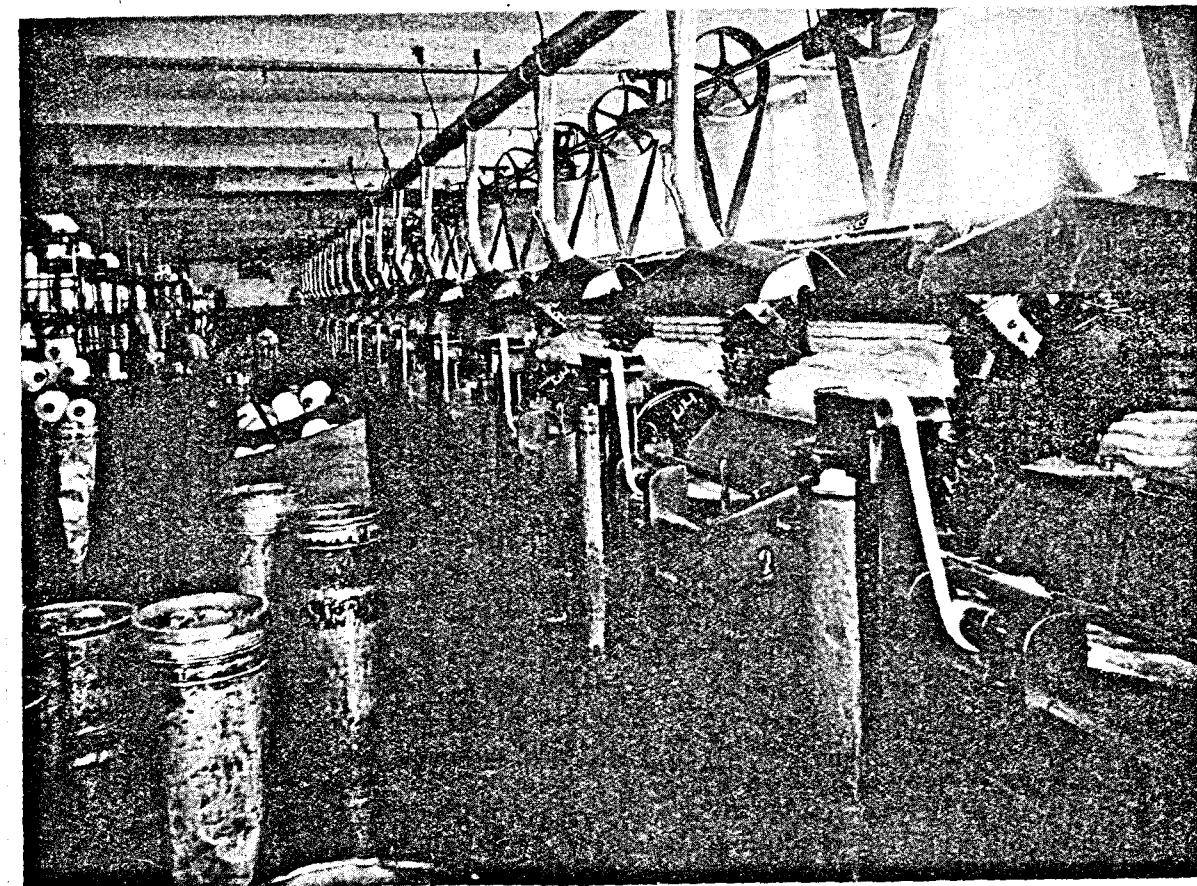
Industry.	1912	1904	1899
Smelting	56	33	61
Printing	37	15	25
Tinning	15	10	24
White lead	23	116	399
Earthenware	80	106	249
Paints and colours	19	32	75
Coach-painting	87	49	65

He called special attention to those referring to the manufacture of white lead, earthenware, and paints and colours. In white lead works the extraordinary decrease was due to the taking away of the dust at the point where it was produced, substituting automatic machinery for hand labour, and periodical medical examination. The same held good for earthenware and paint and colour factories. There was no diminution in smelting, printing, and coach-painting for the reason that they could not apply exhaust ventilation. There was another reason: Medical examination of the work-people by appointed surgeons was carried out in white lead factories once a week, and in certain other industries once a month. These gave indication of commencing plumbism, and enabled the workmen to be transferred to other less dangerous processes. There was no such examination in coach-painting or printing.

The essential conditions for exhaust ventilation are (1) the draught set up either by heat or by a fan; (2) the ducts along which the current travels; (3) hoods or air guides to catch the fumes and dust at the point of generation; (4) inlets from the outside air into the room to replace continuously the air extracted, and, in many cases, (5) a suitable dust filter or collector. Having pointed out the difference between certain kinds of hood as shown in the pictures, the lecturer said that the great defect in most installations in connection with the utilisation of the heated current of air from molten metal, or from the furnace flue, was that the diameter of the pipes leading from hoods (on the efficacy of the draught in which success depends) was much too small. Frequently mere increase in size would convert an indifferent draught into a good one. The height of the hood also—that is, the distance between its lower border and the point where it joins the duct—is of importance. The shorter this distance is, the less serviceable does it become for the removal of the fumes. Indeed, it may even retain the fumes, which, were the hood not present, would rise to the roof. With a fan, ducts of less diameter can be used than when dependence is placed on heat alone. A duct carried into a chimney-stack has the advantage of dispersing the fume at a safe distance from the workmen. A picture was then shown representing what Dr. Legge declared to be a most successful utilisation of heat as the exhaust. From a brass melting crucible the heat and fumes given off in pouring the metal into the mould is very great. The occupier of a Birmingham factory (Messrs. Rainsford &

Lynes) devised a cap to fit over the crucible in connection with a flexible pipe leading into a flue. In this way the heat from the crucible removed 90 per cent. of the fumes. The variable-ness of the draught produced by heat makes it, however, unsuitable for removal of dust, except such as arises from skimming operations. The lecturer then showed pictures illustrating exhaust ventilation by fans. Of these there are two types: (1) Low-pressure volume fans and (2) high pressure centrifugal fans. In the first the draught is created by the rotation of a

outflow in front, as from wind pressure. Under favourable conditions, however, and when carefully fitted, a volume fan will exhaust dust and fumes through a system of ducts several feet in length, as, for example, from mono- and linotype machines and electro melting-pots in letterpress printing works. But, in order to avoid resistance from friction, the ducts have to be somewhat larger in diameter than when a centrifugal fan is used. The shorter and straighter the course of the duct to the propeller fan, the more efficiently it works. To produce



DUST EXTRACTORS OVER A SERIES OF CARDING MACHINES. See page 174.

wheel with inclined vanes, causing the air to be driven transversely through the wheel parallel to the axis of the rotation. During a revolution a portion of the air is cut off from one side of the wheel and transferred through the wheel to the other. Such fans are light, run easily, and are cheap. They are of many forms, both with regard to the number of blades, and the manner in which these are arranged. Their main defect is inability to overcome any but slight resistance in the course of suction behind, as from constriction in, or friction along the sides of, the ducts and right-angled bends, or of

sufficient draught for taking away heavy dust high pressure is required. A picture of Davidson's dust centrifugal fan was then shown, and described as follows: A fan-wheel formed by a number of vanes attached to an axle mounted in a spiral-shaped casing—so that when the wheel rotates, air is carried along by the vanes, and flies off tangentially into the space between the blades and the casing, and thence to the outlet. The air inlet or junction of the fan with the exhaust duct is at the centre of the fan, an arrangement by which the kinetic energy created by the rapid motion of the air leads to

increase of draught instead of being wasted in production of eddies in the surrounding spaces.

The main duct should be of metal, be circular in shape, have a straight and short a course as possible, and be tapered in such manner that the area of cross section at any point shall equal the combined areas of all the branch pipes which have entered it at that point. Right-angle joints diminish the draught by nearly one half. Branch ducts should never be made to enter a main duct on the outer side of a bend, because at this point the pressure of the current of air inside the duct is increased. They should join up on the inside of the bend where the pressure is reduced.

Having dealt now with the ducts, it was necessary to collect the material removed, although frequently little heed was paid to the point. Sometimes a dust chamber is arranged to intercept it on the far side of the fan, or an attempt is made by a downward suction draught to blow the dust into a tank of water. Fine dust cannot be satisfactorily collected by either of these methods, nor even by a cyclone separator. In lead works generally, the fine dust removed by the fan is best collected in filter-bags, made of some porous material, from which it is afterwards, at periodical intervals, automatically shaken.

Perhaps the greatest advance in recent years in exhaust ventilation, and one specially applicable to schools and smoking rooms as well as factories, is the system known as the "Pentarcomb" introduced by the Zephyr Ventilating Company of Bristol. When there is a number of branch ducts the difficulty is that the fan draws most of its air from those nearest to it. In order to secure equality of flow from a number of branch ducts, a special grating of curved and slanting inlets—the "Pentarcomb"—is introduced at each branch duct. The air passing through the comb or grids is split up into numerous small columns, and the inclination of the curve which each is made to take is such as to reduce friction to a minimum. By means of this device it has been found in a trunk with twenty branches that the draught at the one farthest from the fan is as serviceable as that next to it.

Several types of exhaust ventilation were illustrated. Pictures made and kindly lent by Mr. J. H. Crabtree, H.M. Inspector of Factories at Oldham, were also shown of the application of the system to the process of stripping and grinding the cards in Lancashire Cotton Mills. In 1908 there was only one installation in operation. Dr. Collis examined

the number of workpeople there, and found 70 per cent. of them suffering from a condition indistinguishable clinically from spasmodic asthma, and many men were leaving the industry on that account. It was decided to take steps to see whether the fine dust could not be removed. A cloud of dust was given off when the stripping roller was applied to the card. The cotton having been opened and the staple drawn out in passing over the metallic toothed card, the points of the card caught the fibre and the debris and retained them. These cards had to be cleaned two or three times a day. The dusty atmosphere was further contaminated by the grinding of the card-teeth when they were worn down. The workpeople at first tried respirators consisting of a pad of cotton, but that was not enough. Next a fan was placed in the window behind the machine. Then a hood was placed over the machine, and connected with a system of pipes running through the factory. Further improvements followed, bringing the point of the ducts and hoods closer down over the cards. Still all this involved a large apparatus, a big branched system of piping taking up much room. A further improvement was made in the use of a portable cover, which can be placed over the carding machine and connected with the duct by a flexible pipe. Hardgreave's vacuum apparatus (of which an illustration was thrown on the screen) is a good arrangement, having an air pump to set up the vacuum and underneath a bag in which the dust is collected. The most modern of all the apparatus is a machine which is brought up close to the card and draws the dust by means of exhaust steam without the intervention of any air pump. In conclusion, Dr. Legge said that improvement in the conditions in the rolling mills in South Wales was being effected by introduction of a plenum system so as to reduce the temperature; and one of the principal difficulties of the stone-mason in cutting and dressing hard stones might conceivably be overcome by supplying him with air through a flexible pipe of small bore, the operation of which would not interfere with his work, and at the same time provide him with a supply of pure air.

DISCUSSION.

MR. SYDNEY SMITH, H.M. Inspector for Dangerous Trades, Home Office, said he had much enjoyed hearing Dr. Legge's recital, and seeing with great interest the series of photos thrown on the screen. Of course, as factory inspectors, many of the examples of ventilating

appliances shown were daily under their eyes, but probably many of them were new to medical officers of health, who could not come so closely into contact with the actual conditions of life in factories. Many of the health problems which arose in the different trades of the country had special characteristics of their own that needed prolonged study and research. As an instance, he referred to those connected with the removal of dust from cotton cards. He remembered twenty years ago it was thought almost impossible to deal with the dust in the card room by any means, and the first attempt to improve the ventilation of such rooms was by means of a fan in one of the windows. In those days they were met with considerable opposition to the introduction of reforms because they were unable to prove injury to the health of workers; and in one important case brought before the Courts the Factory Department lost. Dr. Collis took up the question some five years ago and the result of his work has been that practically all the cotton mills in Lancashire have now adopted some form of localised exhaust apparatus. Moreover, they had set an example to France, Germany, and Italy, which latter country was rapidly becoming a large cotton manufacturing State. He had been surprised last year at seeing in Italian cotton mills such excellent apparatus for ventilation supplied by English firms; and within the past two or three years the system had spread and was developing all over the world.

DR. COLLIS said that his name had been mentioned in connection with investigations he had carried out as to the effect of dust upon those inhaling it and its influence on mortality statistics. His attention had been drawn to a Paper from Dr. Wheatley, of Shrewsbury, in which that gentleman showed that he was able to explain the excess of mortality from tuberculosis in a small country district which up to that time they could not find any reason for. There was a sandstone quarry for building stones. On close investigation it was found that the quarrymen and masons were suffering from tuberculosis although the quarry was situated in a perfectly ideal position, high up in a lovely district of Shropshire, where there were no indications to suggest any prevalence of tubercle. Statistics, however, showed the excess of mortality was entirely among males, and that these males were masons working in the quarry. Dr. Barwise at Derby noticing this report by Dr. Wheatley, thought it would be interesting if he examined the quarries in his own county. His work was not yet published, but he would forgive him (Dr. Collis) if he so far anticipated him by stating that Dr. Barwise showed that tuberculosis was distributed over the county of Derby according to coal, limestone and sandstone districts. By isolating the males from

the females in the mortality statistics he could mark out the geological character of the county of Derby. Men working coal and limestone did not get a high mortality, but those working sandstone which contained silica did. The same explanation might be found if they traced the high mortality from pulmonary tuberculosis in the town of Sheffield. Dr. Hay had also found that the cutters of Aberdeen granite affected appreciably the total mortality of Aberdeen. The high mortality statistics in Northampton were profoundly affected by the deaths in the shoe trade. If notification were made of the occupation of every one who suffered from tuberculosis an explanation might frequently be found of the high mortality from pulmonary tuberculosis both in rural and urban districts. He did not mean to say that back-to-back houses and similar influences had no effect in inducing tuberculosis, but he suggested that no good could be done in a town like Sheffield if attention was not concentrated on the cutlery grinders and their way of life. Information as to the association of high mortality with occupation would often help their efforts to reduce that mortality.

Drs. Goadby, Wm. Butler, Herbert Jones, J. Howard Jones, and Mr. Wolf Defries also took part in the discussion.

POPULAR LECTURES ON PLUMBING WORK.—The London Council for the National Registration of Plumbers is promoting popular lectures on plumbers' work in its application to public, sanitary and water services, and domestic purposes. A meeting of residents in East Ham of sanitary officers and others has been held in the Council Chamber, Town Hall, Stratford; at which the medical officer of health, Dr. Benton, quoted instances of injury to health arising from defective plumbing work.

CITY OF YORK.—In his report for 1911 Dr. Smith draws special attention to the fact that the zymotic death-rate showed a decided increase over that for the previous year, due, he points out, to an increase in the number of deaths from whooping-cough and diarrhoea and enteritis. The infantile mortality-rate he found also was higher than for some years previously, and he urges upon his council the importance of not slackening in their efforts to protect infant life. Reference is made to a widespread epidemic of contagious ophthalmia amongst the children attending certain schools. Over 250 cases were treated at the school clinic, and two schools were closed on account of the disease. The report contains statistical and other evidence that public health work is seriously carried out in York. Amongst general sanitary work food inspection and housing received special attention. Numerous closing and demolition orders were made.

HUMAN TUBERCLE BACILLI IN THE MILK OF A VACCINATED COW.

AT a time when efforts are being made to render the bovine animal immune to tuberculosis, a paper by Dr. A. Stanley Griffith, published in the January number of the *Journal of Pathology and Bacteriology* shows the necessity for caution in the use of human tubercle bacilli for this purpose. In the course of investigations made for the Royal Commission on Tuberculosis he found that when tubercle bacilli, human or bovine, were injected into the blood stream or in the subcutaneous tissues of cows and goats, they not only made their appearance in the milk within twenty-four hours of their injection, but also continued to be excreted therein for long periods subsequently. He quotes, moreover, experiments made by Titze, who inoculated three cows intravenously with culture of human tubercle bacilli and found by the test of inoculation of guinea-pigs that, in one, the bacilli appeared in the milk within twenty-four hours and was subsequently found to be present thirty-eight days after inoculation. In another the excretion of tubercle bacilli began in the third week and was continued for 144 days. In the third experiment three injections of culture were given at intervals of about three months and tubercle bacilli were not excreted in the milk until after the third injection, when a larger dose was given.

Dr. Griffith subsequently extended his observations to some heifer calves, which had previously been inoculated subcutaneously to test the virulence of various sorts of culture, in order to ascertain whether or not tubercle bacilli had been excreted into the milk sinuses of the undeveloped mamma. Material for investigation was obtained from the mamma by ejecting saline and recovering the fluid in the case of eleven heifer calves, two of which had been inoculated with human and the others with bovine tubercle bacilli. In five cases they were detected microscopically and in four in such numbers as to suggest that they had multiplied.

Later, as Grocer's Research Scholar, he had the opportunity of testing the milk of two heifers vaccinated as calves, and in the milk of one of them he demonstrated human tubercle bacilli. This calf had been injected intravenously when four months old, presumably with a minimal dose. She calved when she was two years and four months old and some of the milk from

each of the four quarters was obtained for examination. The milk from the right fore-quarter was injected into two guinea-pigs and from each of the other quarters into other guinea-pigs, five guinea-pigs being thus used. Three guinea-pigs died shortly after inoculation, leaving two, of which one, inoculated with milk from the right hind-quarter, died of general tuberculosis thirty days after inoculation, the other inoculated from the right fore-quarter, killed thirty-four days after inoculation, showed early generalized tuberculosis, and from each of these guinea-pigs a culture of human type was isolated. The milk was again tested forty days after the heifer had calved and was again proved to be tuberculous. Four guinea-pigs were inoculated, one from each quarter, two of the guinea-pigs with the milk from the hind-quarters becoming tuberculous while a culture from one of them exhibited the culture characters of the human tubercle bacillus. Dr. Griffith concludes that, whatever value the injection of human tubercle bacilli may have in producing immunity in cattle to bovine tubercle bacilli, this method ought not to be practised upon animals destined for dairy purposes.

APPOINTMENTS.

DR. THOMAS BUCKHAM, of Lanchester, has been appointed medical officer to the Lanchester R.D.C.

DR. ELSIE MARY CHUBB has been appointed assistant school medical officer, and assistant medical officer of health of Acton.

DR. W. H. DICKINSON has been appointed medical officer to the tuberculosis dispensary.

DR. ALFRED GREENWOOD, of Blackburn, has been appointed medical officer of health for the county of Kent.

DR. F. J. HENRY has been appointed tuberculosis officer of Middlesbrough.

DR. THOMAS RHIND, of Hawkesbury, medical officer to the Chipping Sodbury and Thornbury Rural District Councils, has been appointed school medical officer for the South Gloucestershire united districts.

DR. JOHN TATE has been appointed deputy county medical officer of health of the county of Middlesex.

DR. HENRY HYSLOP THOMSON has been appointed tuberculosis officer for the county of Hertford.

DR. WYVILLE S. THOMSON, M.B., Ch.B., D.P.H., Edin., has been appointed senior medical officer to the Tuberculosis Dispensary, Leicester, and senior assistant medical officer of health.

DR. K. WANT has been appointed medical officer of health to the Reeth R.D.C.

DR. JOHN YOUNG has been appointed medical officer of health for Lasswade.

RESIGNATIONS.

DR. A. G. R. CAMERON, county medical officer for West Sussex, has tendered his resignation.

DR. CHARLES WILLS has resigned his position as medical officer of health to the Blyth and Cuckney Rural Council.

*THE WARFARE AGAINST TUBERCULOSIS.

THE Lady Priestley Memorial Lecture on "The Warfare against Tuberculosis," recently given by Professor Metchnikoff to the members of the National Health Society, is of profound interest to all for the reason that it shows how the problem of the prevention of tuberculosis presents itself to the mind of this great student. The lecture was in the main a discussion of the efforts which had been made by others to control this malady, and was largely a popular exposition of their views. Professor Metchnikoff thus began with a statement of the belief of the inhabitants of the Balearic Islands in the eighteenth century of the infectivity of tuberculosis, and of the experimental work of Villemin some fifty years ago, who demonstrated its inoculability. He then proceeded to refer to Koch's discovery of the tubercle bacillus, and to show the part played by the phagocytes in the efforts made by the invaded organism to resist the further extension of the disease. After reference to the difference in the incidence of mortality from tuberculosis on the native Portuguese inhabitants of Madeira and the European inhabitants of that island, he gave account of his visit a year or two ago to the Kalmuks, who inhabit the Steppes in the neighbourhood of the Volga and the Caspian Sea, and who live entirely separate from their neighbours, the Christians and Mussulmans. Here he found that the Pirquet reaction tested on several thousand persons showed that "infection by the bacillus of Koch is notably more frequent at the periphery of the Steppes than in the central region, and that it is chiefly the neighbourhood of a sedentary population which contributes to the propagation of the tubercle bacillus among the Kalmuks." About one half of sixteen young Kalmuks who had just arrived at Astrakhan in 1911 did not give any reaction with tuberculin, whereas of thirty-seven others who had been there for more than a year only one failed to show reaction. So, again, he referred to Calmette's enquiry into the prevalence of infection in the French Colonies, which went to show that "the proportion of affected individuals increases in proportion with the intensity of the commercial activity and the immigration of foreigners." He commented also on the results of the inquiry by Jacob, that children living in houses where there are cases of tuberculosis in full progress always give the tuberculin reaction, but children also giving the reaction are found where no case of infection could be discovered. Thus 30 to 40 per cent. of the children in the villages of Saxony reacted where there had

not been a single case of phthisis for many years, and in one locality, where tuberculosis was very rare and no death from this disease had occurred in ten years, 25 per cent. of the children attending the schools reacted. Immunity from phthisis he appears to attribute in the main to unconscious "Vaccination," and he cited his own immunity from an infection to which he was intimately exposed as an adult to an ophthalmic scrofula from which he suffered as a child and which completely healed. After discussing the efforts that had been made to control tuberculosis by means of tuberculin and anti-tuberculosis serums, Professor Metchnikoff then dwelt upon the fact that "unconscious nature" obtains much better results than man. He inquired "Is it not possible that it is the bacilli of the bovines which vaccinate men against the human bacillus in the same manner that the human bacillus is capable of vaccinating horned animals against the bovine bacillus? Is it true, as has been several times supposed, that the natural vaccination of man is effected by small quantities of the same human bacillus, which, in large doses, brings about serious tuberculosis?" He referred to the attenuation of bacilli derived from the skin, and pointed out that there exist in man, besides virulent bacilli, attenuated bacilli of the human type, possessing several degrees of attenuation of virulence, and that it is among these bacilli that we must seek for the natural vaccine of tuberculosis or possibly among bacilli coming from pulmonary tuberculosis enfeebled by a sojourn outside the animal body under the influence of air and light. He regarded it as a matter of pure hazard whether dangerous bacilli or vaccinating bacilli are encountered by the child. He endorsed Roemer's interpretation of the decline of phthisis mortality, viz., that it is due to the progressive natural vaccination of the population.

SALTPETRE IN MILK.—At Birmingham, Edward Simpson, Eccleshall, was summoned for selling milk containing saltpetre in the proportion of five pints to 100,000. Mr. Prideaux, who prosecuted for the Corporation, said that saltpetre in milk was a novelty. The proportion worked out at half a grain to a pint. The milk itself was excellent, but milk should not contain drugs. Dr. Higgins, assistant medical officer of health, said that saltpetre was an active drug, and an infant taking half a pint of the milk would be taking an active dose. The defendant said that a customer had complained that the milk had a peculiar flavour, and he explained that milk from cows fed on turnips had a stronger flavour. The Bench dismissed the case on the payment of costs. They said that they were satisfied about the defendant's *bona fides*. Otherwise a serious penalty would have been imposed.

*The complete lecture is now published in pamphlet form by the National Health Society, 53, Berners Street, W.

DURATION OF INFECTIVITY IN DIPHTHERIA.

By DANIEL STEWART, M.D. (Glas.), D.P.H. (Camb.),
late
Medical Superintendent, Middle Ward Hospital, Motherwell.

FOR many years it has been generally accepted that the test of infectivity in diphtheria is the presence or absence of the Klebs-Löffler Bacillus in the person of the whilom patient or "carrier." In the meantime let us accept this hypothesis, though later may be discussed the necessity for the presence of more factors, before infection can take place, than the mere finding of the bacillus on bacteriological examination.

It has been the claim of the medical profession in late years that with regard to infectivity or non-infectivity after diphtheria we are working on a sound scientific basis, whereas in, say, scarlatina or typhoid we can only go on general lines, or, so to speak, by rule of thumb, when pronouncing a person convalescent from these diseases free from infection.

However, in probably the majority of infectious diseases hospital patients are not considered free from infection until two consecutive cultures from the fauces and other parts have failed to show the presence of the diphtheria bacillus.

In the Middle Ward Hospital, up till 1910, the same practice was religiously carried out. In 1909 (M.W. Report, 1909, p. 17) I found that the average duration of residence before two negative swabs were obtained was:

In mild cases, 26.8 days;

In moderate cases, 37.1 days; and

In severe cases, 40.4 days.

I do not suggest that these figures show that the more severe the case the longer the duration of infectivity, because the swabbing was begun at an earlier stage of residence in the milder cases, so that the severe cases may have proved free from the bacilli as soon as the milder cases, but more importance was attached to general condition as a guide for dismissal. Four cases with very mild clinical features, but with chronically enlarged tonsils, were, respectively, 67, 37, 55, and 52 days in residence before two negative swabs were obtained.

For some time during 1910 the usual two-negative-swabs-before-dismissal custom was adhered to, and then for some months patients were discharged when the general condition was good, disregarding the bacteriological finding, whether positive or negative. In cases where a patient was discharged with swab still positive the Public Health Department was notified, and that department kept a watchful eye on the house and locality to which the patient returned from hospital. In this way we were kept in touch

with the potentially infective discharged person, and were soon made aware of "returns."

Latterly, in 1910, patients were sent out when clinically in good condition, without ascertaining whether or not they carried the diphtheria bacillus.

My hands were strengthened in this last course by my experience in the scarlatina wards of the hospital, where the cessation of bacteriological examination of scarlet fever admissions and the cessation of segregation of "positives" was not followed by any increase in diphtheria.

The test of the wisdom or otherwise of the departure from orthodox measures would be the infecting of other persons by patients after dismissal, or, in other words, by "returns."

In the district served by this hospital, by reason of the sanitary supervision, we are soon informed as to the occurrence of "returns," and additional sources of information are the general practitioners, who are very keen on tracing any infection apparently originating from the fever hospital, and who take good care that the public health authorities know about it.

In all 29 patients were discharged from hospital with positive swabs, and from these only one case eventuated which may have been a return. The circumstances were these: a girl of three was dismissed after 19 days' residence. In hospital she showed no membrane, but fauces reddened, with a positive swab. She was dismissed on a Saturday afternoon, and that night a relation, a girl of ten, visited the discharged patient's home, and they presumably were in close contact. Two days later the elder girl developed a sore throat, and was admitted to hospital, when I found her to be suffering from an attack of mild faucial diphtheria. This was apparently a return case; but it is to be remembered that there had been previously a good deal of diphtheria in the neighbourhood.

On the other hand, two patients, discharged after having two negative swabs, were apparently infective, and gave rise to two return cases.

Thus there were altogether three return cases, giving a percentage rate in discharged cases of 1.1.

Thus: out of 29 cases discharged with a positive swab, one return; out of 90 cases discharged with two negative swabs, two returns; out of 100 (about) cases, in which it was not ascertained whether swabs were positive or negative, there were no returns.

These figures are not flattering to the utility of a bacteriological examination in this connection.

Another circumstance which makes one rather sceptical of the value of the bacteriological examination was that it was often found that patients, after having shown two consecutive negative swabs, sometimes subsequently showed a positive result.

REVIEWS.

BACTERIA. By Dr. Max Schottelius. With 10 coloured plates and 33 illustrations. 2nd Edition; translated by Staff-Surgeon H. Geoghan, R.N., pp. 324. London: Oxford University Press, Warwick Square, E.C., 1912.

This is a small work which aims at informing the general public upon some interesting and important facts connected with bacteria and protozoa. The informed reader of this book is at once struck with the inequality of treatment of the various matters discussed. The opening chapters, for instance, are written in quite a popular strain and the treatment is very superficial; whereas the chapter on "Immunity and Protective Vaccination" is much more advanced and perhaps a little beyond the average lay reader. It must be conceded that it is not easy to set out much that we know with respect to bacteria in a way which will usefully inform the lay reader. It is a difficult and invidious task, as the author recognises. Difficult on this account, that the special science bacteriology assumes from year to year a more and more complicated form and new methods are rapidly supplanting the old. Invidious on this account, that the reader who has no scientific training may be led to imagine that he can pronounce judgment on difficult biological questions from the superficial knowledge which can alone be conveyed by a small popular work. Probably the most useful chapter to the lay reader is chapter iii, which deals with "Disease and the means of combating Infectious Diseases"; but a large amount of interesting matter is presented in a very readable form in this small volume.

RESULTS OF TUBERCULIN RESEARCH, 1911. By Dr. F. Köhler. Reprinted from the Clinical Year-Book (26th volume) and translated by R. E. S. Krohn, M.D., pp. 245. London: John Bale, Sons & Danielsson, Ltd., 1913.

Dr. Ronald Krohn has done good service to those British readers who have little German, by translating Köhler's "Annual Report" for 1911. Although he modestly pleads, in excuse for any faults, that his task was undertaken at short notice, and completed under high pressure, yet it has been excellently done. It is greatly to be hoped that such a measure of appreciation will be vouchsafed to the present enterprise that Dr. Krohn will be enabled to continue to translate Köhler's reports, and to present them to us before the end of each year of issue. The matter has been, as in the original, analytically arranged, and an excellent index of authors is given, as well as one which is general, and a synoptical table.

Reference therefore is easy. As is only natural, Köhler is in the habit of giving greater attention to the work done on the Continent than to that published in Great Britain; but, however much we may be inclined to regret that our German

Like examining for the tubercle bacillus in a suspected phthisical sputum, a positive result is of great value, while a negative result has little value.

FACTORS NECESSARY FOR INFECTION.

A certain degree of *virulence* must be possessed by the bacilli before infection takes place. No doubt in many cases during the stay in hospital the virulence of the bacilli diminishes, and may disappear.

Buchanan (B.M.J., 1909, II., 519) found that diphtheria bacilli recovered from 50 cases of the disease proved virulent in 74 per cent., while of 21 cases of healthy "carriers" in 66 per cent. the bacilli were virulent.

Then as to the number of bacilli. It is reasonable to suppose that there must be a certain minimum dose of virus before infection can be produced—that is, a certain number of bacilli must be present before local signs of disease are shown.

A bacteriological examination may show diphtheria bacilli, but they may be too few or too weak to set up disease.

Garrett (PUBLIC HEALTH, December, 1910, p. 106) says:—"It is claimed that when a bacteriological test is practised a return case is unknown, or almost unknown. But that is exactly the experience of those who discharge their patients without swabbing, after some three weeks' treatment, longer and shorter as the character of the case may demand."

Taking all the present data into consideration, it appears to me that the necessity of swabbing for examination of the throats of hospital-treated patients is contra-indicated by practical experience, the likelihood of infection being infinitesimally small.

Patients also are entitled to some consideration. It has been estimated (Chapin, p. 57, "Sources and Modes of Infection") that at least 1 per cent. of the general population are going about with diphtheria bacilli in their throats. This means that in the Middle Ward District of Lanark there are probably about 2,000 diphtheria carriers. It does not seem consistent to deprive a few dozen patients of their liberty while so many in the same condition are going about unchecked.

The question of dealing with diphtheria carriers is one for the public health authorities.

The hospital physician must look at the question of detention from the point of view of his patient's best interests, consistently, of course, with the safety of the general public.

FEE-SPLITTING.—The legislature of Wisconsin, U.S.A., has before it a bill to make fee-splitting a penal offence.

colleagues may be imperfectly informed of the work that we are doing, it is of course, from our point of view, advantageous to have a compendium of the papers with which we are least acquainted rather than a summary of what we may learn from our own journals. And, excellently though our great journals do fulfil their subsidiary task of giving us epitomes of foreign publications, it cannot be denied that there is much in this volume, of interest and importance, that has escaped general notice in this country. A striking point of view, for instance, is that adopted by Hansemann, and referred to on page 57. This author, whilst asserting, as he is no doubt justified in doing, that pulmonary tuberculosis is always, anatomically, a part of a general tuberculosis, goes on to enunciate the proposition that, in respect of "true tubercular phthisis," the tubercle bacillus is only one of the etiological factors. It is true that it is a necessary factor in the production of typical caseation; yet it alone will not suffice to produce phthisis. Other factors—the secondary infections, and "anatomical predisposition" in the Freund-Hart sense—must be regarded "as equal in importance and rank to it." Here we have not only justification, if justification were needed, for the position adopted by Dr. Hamer in his presidential address to the Epidemiological Section of the Royal Society of Medicine last October, with respect to the importance of the mere bacillus, but some justification for the plea, advanced at the November meeting of that Section, for the maintenance of the old distinction between tuberculosis and phthisis. Other pages that will be found of great interest are those dealing with the work of Much; so strangely overlooked by British authorities. There can be hardly any doubt but that, startling though the notion may seem to many, Much has proved that the tubercle bacillus of Koch, as we know it, is only one phase in the evolution of a polymorphic organism that has a life history strangely resembling that claimed by Rost and others for the causal organism of leprosy. In fact we must recognise, not only the acid-fast rod, but three not acid-fast forms: one rarely occurring as solid rods; another, that is "granular" and occurs in chains, and a third, which is granular, but not seen in chains.

It is perfectly clear that the substantiation of Much's observations is a matter of the very highest gravity and importance, and the fact that corroboration has lately come from Italy (Costantini: "La Riforma Medica," 1912, xxviii, pp. 1121-28), and from France and Spain (Ferran: "Archives gén. de Médecine," 1913, January) should stimulate our appreciation of the issues involved, and of the importance to us of the book that Dr. Krohn's labours have rendered accessible to us in so agreeable a form.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856.

RECONSTRUCTED 1888.

INCORPORATED 1892.

AN Ordinary Meeting of the Society of Medical Officers of Health was held at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, February 14th, 1913, at 5 p.m. Present: Prof. E. W. Hope, President (in the chair), Sir Shirley Murphy, Drs. T. Ridley Bailey, J. S. Tew, F. J. Allan, Charles Porter, Herbert Williams, A. N. Stevens, J. Tate, J. J. Paterson, A. E. Porter, J. M. Clements, J. J. Clarke, A. Ball, Thos. Strain, J. Wright Mason, M. K. Robinson, C. Rolleston, R. A. Dunn, J. Tubb-Thomas, Herbert Jones, Sidney Davies, Charles Sanders, and Mr. George Briggs, Chairman of the Port of London Sanitary Committee (visitor).

MINUTES.—The minutes of the previous ordinary meeting, held on January 10th, 1913, and published in PUBLIC HEALTH (February, 1913, p. 151), were taken as read, approved and duly signed by the Chairman.

ELECTION OF FELLOWS.—The following candidates, who had been duly nominated, were balloted for, and were declared by the President duly elected:—

Cyril Banks, M.B., B.S., D.P.H., Town Hall, Birkenhead; Wm. Edward Burton, M.R.C.S., L.R.C.P., D.P.H. Brockton, Frodsham, Cheshire; A. Middleton Hewat, M.D., D.P.H., County Hall, Ipswich; Wm. Dixon Jefferson, L.R.C.P., M.R.C.S., North House, Ripon; Thos. McCririck, M.A., B.Sc., M.D., D.P.H., 29, Kelso Road, Leeds; William A. Milne, M.B., Ch.B., D.P.H., 9, Victoria Street, Penistone.

NOMINATIONS.—The Hon. Secretary read a list of nominations for election to the Fellowship of the Society.

The President said that, before calling upon Dr. Wright Mason to read his paper, the melancholy duty devolved upon him to propose a vote of condolence with the family of their late member, Dr. J. F. J. Sykes. At the last meeting at which he presided, Dr. Sykes was present. He had been a member of their Society for between twenty-five and thirty years, and had occupied various positions of honour in it, including those of secretary and president. Dr. Sykes presided over the Society in 1904-5, and many of them would recollect the address he gave on that occasion—one of the most interesting which the Society had ever had. It was upon the question of "Public Health and Architecture"; and if members who did not recall it were to turn up the pages of the Journal for that year they would be quite rewarded for their pains. Dr. Sykes was a personal friend to most of them; he himself had known him longer than twenty-five years; and all of them thought of him with the warmest

feelings of regard and affection. He therefore moved that the secretary be asked to express to Dr. Sykes's family their warmest appreciation of his services and their great sorrow at his early death.

The resolution was passed in silence by the members rising in their places.

Dr. WRIGHT MASON then read a paper on the "Duties Imposed on Port Sanitary Authorities," and the following took part in the subsequent discussion:—The President, Dr. Herbert Williams, Mr. Briggs, Drs. K. Robinson, J. Tubb-Thomas, and Herbert Jones.

Southern Branch.—A meeting was held at the Southampton Municipal Dispensary, on Friday, February 7th, at 2.30 p.m. Present: Dr. J. A. Gibson (President), Drs. W. G. Willoughby, J. Teare, J. Lockhart Livingstone, R. E. Lauder, J. P. Walker, J. Fenton, H. L. Hamilton and J. Fairley. The minutes of the last meeting were read and confirmed. Letters of apology for absence were read from Drs. Stott, Fraser, Lockhart Stephens and Lister.

The correspondence from the Parent Society re the action of the British Medical Association toward Drs. Duncan Forbes and Hutt was discussed, and it was resolved that the resolution passed at the last meeting regarding the resignation from the British Medical Association of each member of the Southern Branch be placed on the agenda for the next meeting.

A letter was read from the Secretary of the Parent Society intimating that nominations for the Presidency of the Society for the ensuing session might now be made. It was resolved that Dr. Herbert Jones, of Hereford, be nominated for the Presidency of the Society.

It was decided to hold the next meeting of the Branch at Portsmouth on the first Friday in March.

Dr. Lauder then read a paper on "The Southampton Dispensary and Modern Methods of Diagnosis in Tuberculosis." The routine method of dealing with patients at the dispensary was described: cases were shown illustrating various points, and the use of the X-ray apparatus for screen and photographic work in patients was demonstrated. A discussion then took place, and after the members were shown over the premises of the dispensary they were entertained to tea.

The meeting terminated with a hearty vote of thanks to Dr. Lauder for his interesting paper and kind hospitality.

Midland Branch.—The last meeting of the Branch was held on Thursday, February 13th, 1913, at the City Isolation Hospital, Bagthorpe, Nottingham, at 1 p.m. Present:—Dr. J. Doig McCrindle (President), Drs. H. C. T. Langton,

* To be published in the April number of PUBLIC HEALTH.

C. K. Millard, R. W. H. Jackson, Henry Handford, Philip Boobyer, S. Barwise, George Reid, J. R. Edward, R. Woolsey Stocks, Jean R. Shaw, T. Robinson, H. Gibbons Ward, V. Gray Maitland, and E. H. Snell. Also as visitors Alderman Windley, Messrs. J. G. Small, George Hutton, H. M. Gray, A. J. Cash, A. B. Gibson, E. H. Goddard, Thomas Horton, and F. W. Franks. Apologies for non-attendance were received from Drs. Petgrave Johnson, Ridley Bailey, Henry May, and Harold Mason. On arrival the members and visitors were entertained to lunch at the kind invitation of J. G. Small, Esq. (chairman of the Nottingham Health Committee) and Dr. Boobyer. The chairman of the Health Committee and Dr. Boobyer then conducted the party around the hospital, the latter explaining the methods adopted there in the way of the open-air treatment of infectious diseases. On the proposition of the President (Dr. J. Doig McCrindle) a hearty vote of thanks was carried to Mr. Small and Dr. Boobyer for their kind hospitality. Mr. Small and Dr. Boobyer briefly replied. Before departure tea was kindly provided for those present; this terminated a very interesting and instructive afternoon.

Metropolitan Branch.—A special meeting of this Branch was held on Friday, January 31st, for the purpose of nominating a Fellow as President of the Society for the session 1913-1914. Before passing to consider this question the President of the Branch (Dr. E. G. Annis) drew attention to the fact of the death of Dr. J. F. J. Sykes, one of the oldest members of the Branch, and moved that a vote of condolence with the members of the family should be sent. Sir Shirley Murphy and Dr. F. J. Allan supported the motion of the President, and the secretary was instructed to communicate the sympathy of the Branch with the members of Dr. Sykes' family in their bereavement.

After the notice convening the meeting had been read, and a communication from the secretary of the parent Society pointing out that nominations of branches for the Presidency of the Society for the session 1913-1914 should be in the hands of the secretaries not later than Monday, February 10th, 1913, Sir Shirley Murphy moved, and Dr. Caldwell Smith seconded, that Dr. Chalmers, medical officer of health of Glasgow, be the Fellow nominated by the Metropolitan Branch and that the secretary of the Society and the Secretaries of other branches be so informed. A number of members having spoken in support, the motion was put and carried *nem. con.* The members present included Dr. E. G. Annis (President) in the chair, Drs. Allan, Bond, Butler, Parkes, Sir Shirley Murphy, Caldwell Smith, Spaul, and Charles Porter (Hon. Sec.).

On Friday, February 14th, an ordinary meeting of the Branch was held, when there were present Dr. E. G. Annis (President) in the chair, Drs. King Patrick, Sandilands, Shrubsall, Caldwell Smith, Spaul and Porter (Hon. Sec.).

The chief business transacted was a discussion on the "Selection of Cases for Sanatorium Treatment" introduced by Dr. Shrubsall, whose paper proved most interesting. Practically all the members present took part in the discussion, and the President, who moved that the thanks of the meeting be accorded to Dr. Shrubsall for bringing the matter forward, voiced a general feeling when he expressed the hope that the paper would be published in the Journal of the Society.

DISCONTINUANCE OF THE FREE ADMINISTRATION OF DIPHTHERIA ANTITOXIN IN NEW YORK.—The free administration of antitoxin in diphtheria and the performance of intubation by the inspectors of the Department of Health of the City of New York was begun in 1895, the objects in view being not only the cure and prevention of the spread of the disease, but also the education of the medical profession and the general public. These ends have been accomplished. The death rate of the disease in Manhattan and The Bronx has fallen from 15.9 per 10,000 of population in 1894 to 2.2 in 1912. In 1894 twenty-nine out of every one hundred cases reported died. In 1912 less than nine cases out of every hundred died. Since 1895 almost 40,000 cases have been injected with antitoxin furnished by the Department of Health, and of these less than six per cent. proved fatal. Finally, the records show that at the present day practically every case of diphtheria receives antitoxin.

On and after February 1, 1913, therefore, the present system of free administration by inspectors of the Department of Health of diphtheria antitoxin and performance of intubation at the homes of patients, at the request of the attending physician, will be discontinued. After that date when it becomes necessary for the Department of Health to administer antitoxin or perform intubation in any case of diphtheria the patient will be at once removed to one of the hospitals of the department for further observation and treatment. Diphtheria antitoxin may still be obtained free of charge by physicians from supply stations at drug stores for use, where payment for the same by the patient would be a hardship.

SMALLPOX IN THE UNITED STATES.—One of the "cheerful things" about the outbreaks of smallpox in Philadelphia and Baltimore, says the *Lancet-Clinic*, is that the daily newspapers give full details of the new cases and their situation, in this way affording the citizens ample warning of impending danger and giving them full opportunity to protect themselves.

LAW REPORTS. HIGH COURT OF JUSTICE. KING'S BENCH DIVISION.

October 31st, 1912.

BEFORE ALVERSTONE L.C.J., CHANNELL AND AVORY, J.J.

ROSS v. HELM.

Sale of Food and Drugs Acts, 1875 and 1879.—Sale to Prejudice of Purchaser—Proof of Appointment—Sufficient Evidence—Necessity for such Proof.

If on a prosecution under Sect. 6 of the Sale of Food and Drugs Act, 1875, for the sale to the prejudice of the purchaser of an article not of the nature, substance, and quality demanded—namely whisky—the prosecutor states he is an inspector under the Acts, and he is not cross-examined in regard thereto; this statement is sufficient evidence that he is an inspector. Channell and Avory, J.J., also expressed the opinion that there is no necessity for the prosecutor to prove he was an inspector.

This was a case stated by the justices for the West Riding of Yorkshire on the hearing of an information laid by one Alexander Ross against Richard Helm, an innkeeper. It charged him with selling whisky not of the nature, substance, and quality demanded to the prejudice of the purchaser. The purchase was made by Ross and the analyst certified that the sample contained 11.4 per cent of water below the minimum legal strength prescribed by Sect. 6 of the Sale of Food and Drugs Act, 1879. Ross in his evidence stated that he was an inspector under the Food and Drugs Act, but gave no further evidence of his appointment, and he was not cross-examined thereto. At the conclusion of his evidence it was contended for the defendant that Ross had not proved he was a duly authorised officer, and that he had not produced his appointment, and that the case ought to be dismissed. Ross asked for an adjournment so as to produce his appointment.

The justices dismissed the information, holding that Ross should have formally proved his appointment and that as he had closed his case he could not put in further evidence.

The High Court allowed the appeal and remitted the case to the justices to hear and determine the case.

ALVERSTONE, L.C.J., said he decided the case solely on the ground that there was evidence that Ross was an inspector and that the case ought to have proceeded. Ross had stated that he was an inspector under the Food and Drugs Act, and he was not cross-examined on the point. There was no necessity for formal proof of his appointment. The production of his written appointment was not necessary to prove the fact.

CHANNELL, J., agreed that there was ample *prima facie* evidence that Ross was an inspector. But he saw no necessity for proving that the prosecutor was an inspector, but it was not necessary to decide the point.

AVORY, J., also was of opinion that in proceedings under Sect. 6 of the Sale of Food and Drugs Act, 1875, it was unnecessary for the prosecutor to prove he was an inspector. He also thought that the justices could have adjourned the case to allow of formal proof being given. The appointment was, however, sufficiently proved.

January 21st and 22nd, 1913.

BEFORE DARLING, J., AND A SPECIAL JURY.

FRENCH v. THE IMPROVED INDUSTRIAL DWELLINGS CO.

Sale of Food—Negligence—Alleged Ptomaine Poisoning.

This was an action by Miss French, a nurse, to recover damage for loss and illness alleged to be caused by ptomaine poisoning, as a result of eating boiled mutton supplied by the defendant Company.

The defendant Company are owners of a block of flats known as Waterloo Court, Golders Green. The plaintiff was occupier of one of these flats. A restaurant is carried on by the Company for the purpose of supplying food to the occupants of the flats. Miss French alleged that she dined at this restaurant on September 16, 1910, and was supplied with some boiled neck of mutton. She noticed it was tainted and only ate a small portion. About an hour later she was taken ill with symptoms of ptomaine poisoning, and ultimately had to be taken to a hospital. She had, however, played croquet on the next two afternoons after the first attack although not feeling well. In cross-examination she admitted she had had dysentery twice in South Africa and had since then suffered from colitis.

Drs. Hobbs and Parsons gave evidence to the effect that the plaintiff had suffered from ptomaine poisoning.

Evidence was given for the defendants to the effect that no boiled mutton was served on the day in question and that no one else had complained on that day of the meat. Complaints of tainted meat had afterwards been made.

Dr. Grünbaum, F.R.C.P., gave evidence to the effect that ptomaine poisoning was difficult to distinguish from acute colitis. Obvious decomposition was not a necessary accompaniment of ptomaines and it frequently happened that epidemics of ptomaine poisoning followed the consumption of meat which in appearance was good. The jury returned a verdict for the defendants.

January 22nd, 1913.

BEFORE HORRIDGE, J., AND A COMMON JURY.

CHEVERTON v. PASQUIER.

Sale of Food—Implied Warranty—Negligence—Sardines.

This was an action to recover damages for breach of an implied warranty to supply food fit for human consumption and alternatively for negligence in supplying food not so fit. It appeared that the plaintiff went with two friends on December 28, 1911, to lunch at a restaurant known as the "Mont Blanc," which belonged to the defendant. The plaintiff and his two friends had each sardines for lunch and they shared a bottle of Graves. The plaintiff had other food besides the sardines but the friends had not. The three were taken ill shortly afterwards. The plaintiff was in great pain and fainted and a doctor was called in. The plaintiff was removed to a nursing home where he remained for three days.

Medical evidence was given as to these symptoms being consistent with ptomaine poisoning, and that sardines went bad when the tin was opened.

For the defence evidence was given that the particular tin had been opened that day and that of the 200 customers who daily attended the restaurant, no one had complained before. It was admitted that if sardines were left overnight on a dish the waiter had instructions to put oil over them and they would be served next day, but this would happen very seldom, and on the day the plaintiff visited the restaurant none had been left over from the previous day.

The manager of the firm who supplied the sardines in question to the defendant, said his firm had never had any complaints of the sardines which they supplied to many clubs. They supplied three qualities of sardines. The sardines supplied to the defendant were 7s. 6d. a dozen boxes. His firm had nothing cheaper than that in the same sized tin.

Dr. Walmisley, who had been called in to see the plaintiff on the day he was taken ill, gave evidence for the defendant. His evidence was to the effect that the plaintiff was suffering from indigestion.

HORRIDGE, J., left the following four questions to the jury, which they answered as follows:—(1) Were the sardines supplied to the plaintiff reasonably fit for human consumption?—No. (2) Was the plaintiff's illness caused by such unfitness?—Yes. (3) Was the defendant negligent in supplying the sardines?—No. (4) What damages?—£26 10s.

Judgment for that amount was entered, but costs on the High Court scale were refused.

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VOL. XXVI.

THE STERILIZATION OF WATER SUPPLIES.

WITH the increasing difficulty of finding water supplies which are judged to be free from pollution when examined by the bacteriologist, it is not matter for surprise that effort is made to devise methods of sterilizing water intended for domestic purposes. Notable instances in which a chemical method was resorted to at a time when the polluted supply was producing disease were those of the Maidstone supply in 1897, and the Lincoln supply in 1905. An important paper by Dr. A. C. Houston has now been published in a recent number of the *Journal of State Medicine*, in which are references to these occasions, and in which he gives account of the results he has obtained by the use of lime on Loch Katrine water and Thames River raw water when intentionally polluted with sewage. Dr. Houston's work goes to show that a very practical way of destroying bacillus coli is available, and if we are satisfied with this result as sufficient indication of sterilization we may congratulate ourselves on the existence of a method which, as Dr. Houston says, "is hallowed by precedent," as nearly all drinking waters already contain lime salts.

This method is to add excess of lime beyond that required to remove temporary hardness, and subsequently to remove the excess of lime by addition of untreated water. For the latter purpose Dr. Houston is satisfied with water which has been subject to storage only. Loch Katrine water (a very soft pure water), when rendered impure by addition of one per cent. of crude sewage, is sterilized in five hours by a dose of from 1 to 10,000 to 1 to 20,000 parts, and in twenty-four hours by a dose of 1 to 40,000. With hard waters the dose of lime must be increased because the bicarbonates render the lime inert as a bactericidal agent, and Dr. Houston states that with very hard waters, especially if impure, the dose of lime required after neutralization must be in excess of the theoretical bactericidal dose. In the case of hard, raw

Thames river water, he found that 1 in 5,000 was amply sufficient to kill nearly all the bacillus coli in five hours, and apparently also when the raw water had 1 per cent. of crude sewage added to it. A dose of 1 in 7,500 was, however, not always effective. London sewage required a dose varying from 1 to 1,500 to 1 to 2,500.

Dr. Houston mentions in his paper the circumstances under which the lime process appears to be specially attractive. Obviously they are those in which it is proposed to soften as well as to purify the water, and for which there is difficulty in replacing the supply by one which is uncontaminated or in which some special circumstance indicates the need for chemical treatment. The cost of the application of the lime process is, he says, but small; that of the London water would be about twelve shillings per million gallons for lime apart from other expenses. This undoubtedly must make the lime process attractive to authorities who may prefer to be satisfied with this method rather than incur a larger expense in the provision of another supply.

Apart, however, from the value of the lime process for the purpose of sterilization is that which attaches to the fact that the resultant supply would be a soft water which would be effective in preventing the injury to hot water services and boilers now caused by a hard supply, and in the considerable saving of soap, which would be the sequence to the softening process. In former days these arguments used to be given a prominent place in every inquiry into London water supply. In recent years we have heard but little of them, but they are none the less important, and they should not now be forgotten.

The question remains whether we are to be satisfied, as Dr. Houston suggests, with a sterilization which is judged by the destruction of bacillus coli. That it is of value we do not doubt, and the circumstances indicated by Dr. Houston as making it specially attractive are not to be neglected, but we are not in a position to claim knowledge of all the conditions determining the wholesomeness of a water supply.

INFANTILE MORTALITY AND THE HEALTH OF SURVIVORS IN ELEMENTARY SCHOOLS.

By W. GIBSON PARKER, M.B. (Lond.), D.P.H. (Camb.).

Assistant School Medical Officer for Somerset.

THE question of the effect upon the health of survivors of a high mortality in infancy has given rise of late to some animated discussion, and there appears to be equally little prospect as yet of Dr. Newsholme convincing Prof. Karl Pearson that this effect is injurious, and of the arguments either of the professor or his lieutenants converting the medical officer of the Local Government Board to the view that it is in any sense beneficial.

On one side it is held that a high infantile mortality improves the health of the surviving population by "weeding out" the unfit. On the other hand it is argued that a high infantile mortality is associated with a deterioration in the health of the surviving population, in that the causes of the high mortality, acting not only on those who die, but in lesser degree on the survivors, are injurious to their health.

The routine medical inspection of elementary school children offers an opportunity of applying a test to the rival theories which it seems to me should go far towards settling this very important question if carried out impartially and on an adequate scale. This opportunity has not, so far as I am aware, been embraced by any previous observer; and though I am painfully alive to the inadequacy of the scale of the observations made, the conditions are such that absolute impartiality on the part of the observer can be guaranteed. Although the numbers dealt with are small, their weight is thrown so decisively into one scale in the controversy as to leave little room for doubt that continuation of the observations on a larger scale can only confirm the results now obtained. It was hoped that more extensive data would have been secured, but the inquiry had to be undertaken without undue interference with routine inspection or other work, and could only be carried out where time permitted, and where mothers were present to give the necessary information. The work was done in a considerable number of schools in various urban and rural districts in the county of Somerset, where I have now been doing school inspection for five years.

In the ordinary course of medical inspection the "condition as to nutrition" of every child

examined is assessed, and recorded in four classes, as follows:—

- A = good.
- B = average.
- C = poor.
- D = bad.

In making this assessment, regard is had to the relation of weight, height and age, but more emphasis is laid on general physical condition. Thus a child may be placed in Class A if firm, in good condition and thoroughly fit, though not above, or even though below the average weight and height for age. On the other hand a child may be classed as C if soft and flabby, sickly or anæmic, in spite of being above normal height and weight for its age.

On a separate sheet (not the medical inspection record card) the following items were entered in columns immediately a child had been examined:—

- (1) Name of child
- (2) Sex
- (3) Age, and
- (4) Condition as to nutrition.

Subsequently, and generally after a group of about half a dozen children had been examined, the following items were obtained from the mothers.

- (5) Order of birth of the child examined, i.e., whether first, second, etc., child born alive of the mother.
- (6) Number of children born alive of the same mother.
- (7) Number of deaths, and ages at which they had occurred, among these children.

These items were also recorded in columns on the same sheet, the deaths being recorded for ages 0-1, 1-2, 2-3, 3-4, 4-5, and over 5.

By always assessing the nutrition before making inquiry as above from the parents, any possibility of personal bias was eliminated.

The facts were recorded in respect of 471 children, of whom 115 were placed in Class A, 182 in Class B, 172 in Class C, and 2 in Class D. This gives a larger proportion in Class C than occurs in routine inspection in general. This is in my opinion mainly due to two causes. The inquiry was not limited to children of routine ages for inspection, but also included some children who were being re-examined on account of defects previously found. These children naturally included a larger proportion below normal than the routine children. In addition there is in some schools a tendency on the part of parents whose children are very healthy not to trouble to attend the inspection.

Of course some of the more neglectful parents also stay away, but it is my impression that the proportion of parents present is higher in the case of unhealthy than of healthy children.

The average percentage of children in the various classes for nutrition, in my own routine work, is about as follows:—

Class A, 25 per cent.; B, 46 per cent.; C, 28 to 29 per cent.; and D, just under 1 per cent. This proportion has not for some time varied very much when calculated for a period long enough to obtain sufficiently large figures to eliminate the effect of a few particularly healthy or unhealthy schools. My standard may therefore be regarded as fairly settled and not subject to great fluctuations.

In some cases several children in one family were examined at the same time. In such cases, if I had completed the examination of several children in one family before making enquiry of the mother as to the births and deaths in the family, I included all the children examined in the return. This seemed the best way to exclude the possibility of personal bias in picking out one of several children as typical of the family, if all did not appear in the same class for nutrition, as sometimes happened. If, however, I obtained the records of births and deaths after examining one child, and subsequently examined other children in the family, I did not include these subsequent children in the return. Of course where several children of the same family are included both births and deaths in that family are counted again for each child. It appeared to me that in all probability these cases would occur in a fairly even distribution in Classes A, B and C, and in practice it has seemed to so happen.

The following are the results arrived at by summation of the live births, and deaths at different ages, in families represented at the inspection by children in the various classes.

In the families represented by 115 children in Class A, 481 live births occurred with 27 deaths under one year of age, and 35 deaths at ages under five years. This gives a mortality under one of 56.1 per 1,000 births, with an approximate probable error of ± 7.1 , and under five of 72.8 per 1,000 births, with probable error ± 8.0 .

In families represented by 182 children in Class B, 846 births occurred, with 52 deaths under one and 70 deaths under five; a mortality under one of 61.5 (probable error ± 5.6) and under five of 82.7 (probable error ± 6.4).

In families represented by 172 children in Class C, 868 births occurred, with 82 deaths under one and 108 deaths under five, giving a mortality under one of 95.6, and under five of 124.4.

As there were only two children in Class D, these figures are too small to be considered separately, but having given the figures above for Class C separately, I now give those for Classes C and D taken together. 174 children were examined, 882 live births occurred, with 86 deaths under one and 112 deaths under five, giving a mortality under one of 97.5 (probable error ± 6.7) and mortality under five 127 per 1,000 births (probable error ± 7.6).

Taking all classes together, the mortality under one works out at 74.7 per 1,000 births and the mortality under five at 97.3 per 1,000 births.

It is of interest to note the size of families in the different classes. The figures do not of course represent the final size of the families, as many of them will still be increased. The average number of live births per family where the child examined is in Class A is 4.18. For Class B the figure is 4.65; for Class C, 5.05; and Classes C and D together, 5.07. Taking all classes together the average number of births is 4.69.

I propose subsequently to analyse the figures according to the order of birth, to see if anything may be learned in that way.

The figures representing deaths over the age of five are given in the accompanying table with the other figures, but are of comparatively little interest. The ages at death varied from five to twenty-seven.

In considering these results one must observe that the mortality under one year of age as obtained above is not directly comparable with ordinary infantile mortality figures for at least two reasons. Ordinary infantile mortality figures include families where all children have died, but in my figures of necessity at least one child in the family has survived to school age to be examined. Secondly, there might be included, in the families inquired into, some children alive at the time of inquiry who would yet die before reaching the age of one (or similarly the age of five).

Though not comparable with ordinary infantile mortality figures, these figures for the several classes are, I believe, fairly comparable with one another.

Of the results themselves I need say but little. As far as they go they speak for themselves. Little importance can be attached, in

view of the probable errors, to the differences in mortality between Classes A and B, but the excess in mortality of Classes C and D is most significant. Statistics based on a larger number of inquiries would no doubt carry more weight, and perhaps some other investigator may think this line worth following up.

The results give no support to the hypothesis that a high infantile mortality benefits the health of the population by weeding out the unfit. It would perhaps be too much to say that they prove the contrary, but they certainly support the opinion that a high infantile mortality is associated with a deterioration of health among the survivors.

They also illustrate the association, so generally met with, of high birth-rate and high infantile mortality; at least this is so if it may be assumed that completion of the families will not materially alter their relative size in the

Infantile mortality in families where the child examined is placed in class

A = 56.1 per 1,000 births (probable error ± 7.1).

B = 61.5 per 1,000 births (probable error ± 5.6).

C + D taken together, 97.5 per 1,000 births (probable error ± 6.7). Mortality under 5 years of age in families where child examined is placed in class

A = 72.8 per 1,000 births (probable error ± 8.0).

B = 82.7 per 1,000 births (probable error ± 6.4).

C + D = 127.0 per 1,000 births (probable error ± 7.6).

Average number of live births per family where child examined is placed in class

INFANTILE MORTALITY AND THE HEALTH OF SURVIVORS IN ELEMENTARY SCHOOLS.
SUMMARY OF FIGURES.

Children examined.	Live Births.	Deaths at 0-1.	Deaths at 1-2.	Deaths at 2-3.	Deaths at 3-4.	Deaths at 4-5.	Deaths under 5.	Deaths over 5.
A 115	481	27	5	2	1	0	35	6
B 182	846	52	10	4	2	2	70	8
C 172	868	82	12	8	2	4	108	9
D 2	14	4	0	0	0	0	4	0
C + D 174 ...	882	86	12	8	2	4	112	9
Total 471 ...	2,209	165	27	14	5	6	217	23

three categories. As the size of family probably influences the amount of mortality experienced it would be advisable, if the amount of the material permitted, to compare families of like size. It can scarcely be conceived, however, that the slight difference between the size of families, in groups A and B on the one hand and in groups C and D on the other, could account for the differences in mortality experienced. These are shown by comparison with the probable errors to be very significant, though little weight can be attached to the slight differences between the mortalities of Classes A and B.

I am indebted to Dr. W. G. Savage, county medical officer for Somerset, for permission and encouragement to carry out this investigation, which, though limited in scale, is, I hope, on sound lines.

A = 4.18.

B = 4.65.

C + D = 5.07.

Taking all classes together.

Average mortality under one is 74.7 per 1,000 births.

Average mortality under five is 97.3 per 1,000 births.

Average number of live births per family is 4.69.

The probable error is calculated from the formula for which I am indebted to Dr. Major Greenwood, of the Lister Institute.

Probable error of infantile mortality = $674.49 \sqrt{\frac{p}{n}}$

where p = No. of deaths.

q = No. of survivals.

n = No. of births.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

MEMORANDUM

ON THE MEDICAL OFFICERS OF HEALTH (SUPERANNUATION) BILL.

SET DOWN FOR SECOND READING ON APRIL 18, 1913.

The Bill is presented by SIR PHILIP MAGNUS, supported by SIR HENRY CRAIK, MR. LOUGH, MR. CHARLES BATHURST, SIR HENRY NORMAN, MR. GODFREY LOCKER-LAMPSON, and MR. GLYN-JONES.

THIS is the fourth Bill for the superannuation of medical officers of health which has been before the House of Commons since 1901. The supporters of these Bills were:—

Sir Francis Sharp Powell.

Lord Ilkeston (Sir Walter Foster).

Sir Michael Foster.

Sir J. Batty Tuke.

Mr. Talbot.

Mr. Heywood Johnstone.

Dr. Farquharson.

Dr. A. Hillier.

The following are Members of the present House of Commons:—

Mr. Henry Hobhouse.

Mr. J. M. Robertson.

Sir C. A. Cripps.

Sir Clement Hill.

Mr. Henry Forster.

Colonel Hickman.

Mr. Barnes,

and the supporters of the present Bill given above.

Medical officers of health, whether whole-time or part-time, are included in the provisions of the Bill, which is on a contributory basis. The scale of contributions is 2, 2½, or 3 per cent. of each year's salary, according to whether the contributor has been five years, fifteen years, or more than fifteen years in office respectively. The superannuation allowances are the same as those provided by the Poor-Law Officers' Superannuation Act, 1896, namely, one-sixteenth of the average salary of the final five years of office, except that after ten years' service an additional five years are added for the purpose of computing the allowance. Provision is made in the Bill for the return of the contributions under certain contingencies and within three months of the commencement of the Act medical officers of health may contract out. The superannuation allowances are to begin after the completion of an aggregate service of 35 years or upon the attainment of 60 years, or after disablement sufficient to prevent the officer

discharging his duties with efficiency. When an officer retires after serving more than one authority his superannuation allowance will be paid in suitable proportions by each of those authorities, thus avoiding the position created by the Poor Law Superannuation Act, in which the whole of the allowance is paid by the authority whom the officer last served. Some authorities have already made provision for the superannuation of their officials and if the Local Government Board certifies that such provision is adequate these authorities will be exempt from the provisions of the Bill.

The Royal Sanitary Commission of 1869 attached great importance to provision being made for "superannuation or any other scheme which might put public medical health officers on an equal footing with other branches of the Civil Service."

In a report of the Parliamentary Committee of the County Councils Association, dated August, 1911, it has been pointed out that "a superannuation scheme cannot be regarded as solely for the benefit of the employees; the question of retirement, upon which superannuation depends, is at least as important for the employer, and it may fairly be said that the primary object and effect of such a scheme is to secure efficient service even more than to benefit the employees. Where there is no superannuation scheme, the employee very often desires to continue in the service, and thus draw his full salary after he is no longer able to give efficient service, though it may be difficult or impossible to prove permanent incapacity for work.....Doubtless it has mainly been the paramount importance of thus maintaining the efficiency of their respective services that has led the Government, various public departments, and so many local authorities, public companies, and private firms to establish schemes for the superannuation of their employees at fixed ages."

Schemes are already in force for the superannuation of medical practitioners directly connected with the Civil Service, Poor Law medical officers, and asylums medical officers, and every reason that can be adduced in favour of superannuation for these or for any public official has an added weight in the case of medical officers of health who hold positions of very great responsibility and in the exercise of their duties are subjected to considerable mental strain. Moreover they can hardly be classed among highly paid officials, and have thus little opportunity for saving sufficient from their incomes to enable them to retire when it might

be distinctly in the public interest that they should do so.

The increased flow of promotion through the retirement of senior officials could not fail to increase the popularity of the Public Health service, and to bring to it greater contentment with increased efficiency.

HERBERT JONES, E. W. HOPE,
JOSEPH PRIESTLEY, President.
Hon. Secretaries.

ON THE CONTROL OF DIPHTHERIA AND OF SCARLET FEVER IN LARGE CITIES.

A PAPER by Dr. Rogowski, of Berlin (*Zeitschr für Medizinale Beamte*, 1913, No. 2) is of interest in affording a glimpse of German administrative methods in the control of the above diseases.

The contention is put forward that the method of the spread of diphtheria and of scarlet fever differs according as cities or rural districts are involved. In the country the epidemic starts usually in a particular family and spreads locally, the cases grouping themselves in relation to schools, kindergartens, and business premises, such as dairies or bakeries. In the large cities, however, the writer can trace no such grouping of cases, and he exonerates schools as being only occasionally a source of spread of the diseases in question.

Stress is laid on the very insufficient hospital accommodation for infectious diseases in Berlin. As a result, the majority of cases of diphtheria and of scarlet fever are nursed at home, frequently under very crowded conditions. The possibilities of direct spread of infection are numerous, and disinfection is often inadequate.

The writer suggests that, in the absence of facilities for the removal of cases to hospital, male and female visitors should be appointed to visit each case daily—or, where necessary, more often—to insist on and supervise thorough isolation, to take swabs of contacts and convalescents, to see that disinfection is adequate, and to report any defects in isolation or in disinfection to the municipal medical officer. Confirmation of this report by the medical man in charge of the patient would be followed by compulsory removal of the case to hospital. This, as the writer indicates, would need the provision of legal powers not as yet in existence in Berlin.

THE MEDICAL OFFICER AND THE DIAGNOSIS OF THE MENTALLY ABNORMAL ADOLESCENT.

IN the *Zeitschr für Medizinale Beamte*, 1913, No. 1, Dr. F. Tuczek deals with this question in relation to the conditions of medical administration in Germany. His text is the need for diagnosis and

for supervision of mental abnormality at its earliest stages.

The medical officer should take into consideration the psychopathic and other mentally abnormal members of the community; those who, though not showing signs of definite mental disease, yet have weakness of will, constant indecision, or uncontrolled emotions, which, if not checked in time, are likely to lead to crime, vagrancy, prostitution, or suicide.

The writer discusses the means by which knowledge of these individuals of abnormal mentality can be obtained by the medical officer under the special conditions of medical service in Germany. He suggests the need for interchange of information between medical officer, teachers, clergy, district doctors, police authorities, poor-law officials, school doctors, and others.

In schools special attention should be concentrated on the persistently indolent; the undisciplined, on those who show marked inattention, destructiveness, or lack of desire or of capacity to learn; on the readily tired, the dreamy, the self-absorbed, and others whose mental bent suggests a possibility of subsequent mental disorder. "The whole problem of care of the mentally abnormal adolescent is centred in this:—to protect them, to preserve them from the degradation which threatens them, to develop and make of service whatever normal traits they show, and to limit and neutralise so far as possible their anti-social tendencies."

FOOD INSPECTION.—The Sanitary Inspectors' Examination Board have recently instituted an examination in order to grant a special certificate to meat and food inspectors who have attained the desired standard. This examination is conducted on sound, practical lines; the knowledge of the candidates will not only be tested by their ability to recognise abnormal specimens of organs and carcasses, but, in addition to this, the Board recognise the fact that this is not the class of food generally found in shops, and that it is necessary the inspectors should quickly be able to recognise "frozen," "chilled," and "home killed" meat, the various joints into which butchers cut meat, the position of the lymph glands in the carcase and joints, appearances indicating any attempt to conceal disease, age and sex of carcasses, etc., etc.; in short, to meet the desire of the butchers who have always said:—"We don't object to inspection, we court it; but what we do want is inspectors who thoroughly know their business." The sanitary inspector who obtains this new certificate may be looked upon as being as highly qualified as he can at present become, and in being so will prove a useful assistant to the medical officer of health or veterinary inspector.

SMOKE ABATEMENT.*

By W. L. HAWKSLEY, M.B., Ch.B., D.P.H.,
Assistant Medical Officer of Health, and Acting Chief
Tuberculosis Officer, City of Liverpool.

AT the present time when so much attention is being directed to the Healthy Home, Town Planning and Suburban Development this subject is worthy of careful consideration, and effect should be given to any measures which can be conveniently taken to diminish the nuisance arising from air pollution.

We are all aware of the attention directed towards purity of the public water supply, and of the huge sums spent on securing a satisfactory supply of this necessary article; public opinion is sufficiently strong to admit of this huge expenditure. Peculiar care is taken to ensure the purity of foodstuffs of various kinds, also drugs. The position of the purity of the atmosphere, however, is different, and speaking generally, little attention is devoted to it.

The subject of smoke abatement is not a new one in this country, but has a history extending back no less than 600 years. In the year 1306, when coal had come into considerable demand in London, Parliament complained of the injurious effects to health and property arising from the use of coal, and the then King adopted an effectual means of checking the evils arising from smoke inasmuch as he absolutely prohibited the use of coal. This prohibition was not allowed to exist for any length of time, as we find evidence of a renewed attempt to secure the disuse of coal in the reign of Queen Elizabeth.

However, it was not until the year 1819 that any scientific or effectual attention was directed to the prevention of unnecessary smoke. In that year the importance of the question was admitted in a very practical way by the appointment of a Select Committee of the House of Commons whose terms of reference were to enquire "how far persons using steam engines and furnaces could erect them in a manner less prejudicial to public health and comfort." This Committee reported that so far as they had proceeded they confidently hoped that the nuisance so universally and so justly complained of might at least be considerably diminished, if not altogether removed. In 1843 another Select Committee met, apparently with the same terms of reference. They arrived at a similar conclusion and recommended that a Bill be introduced prohibiting

* A paper read before the North Western Branch of the Society, December 20th, 1912.

the emission of smoke from furnaces and steam engines. In May, 1845, yet another Select Committee reported (apparently finally) that "in the present state of knowledge and experience on this subject it was not desirable to extend the provisions of any Act beyond furnaces used for the generation of steam."

In the same year Sir H. de la Beche and Dr. Lyon Playfair reported to Lord Canning "that it cannot for a moment be questioned that the continued emission of smoke is an unnecessary consequence of the combustion of fuel, and it can be dispensed with." They added, however, "that it is impossible in the present state of our knowledge that any law can be practically applied to the fireplaces of common houses, which, in a large town like London, contribute very materially to the pollution of the atmosphere."

It was not until 1880 that a determined attempt was adopted by the National Health Society to organise public opinion and research. In 1881 a Smoke Abatement Exhibition was organised, and served the purpose of stimulating inventors and manufacturers and others interested in the prevention of smoke. Public opinion does not appear, however, to have been aroused to any great degree by this exhibition and the views of its promoters, for it was publicly urged that since the continuous efforts of our forefathers for more than five centuries had been ineffectual in devising an acceptable and effectual means of burning coal smokelessly, therefore the problem might be regarded as incapable of practical solution. We shall shortly return to this statement and see if it still holds good.

NATURE OF THE NUISANCE.

Coal smoke, to which the nuisance we are considering is due, when examined, is found to consist of carbon, tar, and mineral matter. The amount of these substances deposited on the surface of the ground during the year is very considerable. In London it is estimated that the annual sootfall amounts to 76,000 tons. Ruston, of the University of Leeds, has shown that in the centre of that city no less than 1,900 lbs. of solid matter from smoke is deposited in each year per acre. In addition to these solid matters, however, smoke contains a considerable amount of free sulphuric acid in the form of gas, and when air polluted with such acid becomes damp, it has a deleterious effect upon all forms of stone and metal work, and, in fact, leads to corrosion of the latter.

Sulphuretted hydrogen is also found in considerable quantities in air seriously polluted by smoke; the blackening and disfiguring action of this gas upon metallic articles is well known.

Davis calculates that coal smoke alone produces annually in the British Isles three million tons of sulphuric acid, a considerable quantity of which is showered down in the rain. Dr. Carpenter estimated that in Widnes the same source gave 120 tons per day, much of which is deposited on metallic and other surfaces. These are very large figures, and one cannot help being impressed with the enormous waste which takes place under existing conditions.

Some little time ago manufacturers were compelled to withdraw from fumes admitted into the atmosphere most of the hydrochloric acid. To-day there is no need of such a regulation, because manufacturers would take good care to continue to remove this product because they find it a source of profit. It is curious, therefore, that so little attention has been directed to the recovery of sulphuric acid and other gases, and there appears to be ample scope for investigation in this field.

Coarse solid particles are frequently emitted with the fumes from factory and other chimneys. This grit or other solid products of incomplete combustion may give rise to a serious nuisance, and it will be noted that the Public Health Act, 1875, does not cover such a nuisance.

Under certain conditions of temperature and humidity smoke directly assists in the formation of fogs. Some authorities go so far as to say that smoke is the cause of nearly all dense inland fogs.

SOURCE OF SMOKE.

There is no doubt that the greatest offender in the pollution of the atmosphere, speaking generally, is the domestic chimney. This fact scarcely receives the recognition it deserves, and it is unfortunate that in existing legislation directed against the smoke nuisance no powers are given in regard to smoke emitted from domestic premises. The jerry builder with his unsuitable grates and small chimneys accounts for much unnecessary smoke. In the year 1911 it was estimated that in the City of Glasgow 200,000 domestic chimneys existed, the daily discharge of soot and tarry matters being fully 120 tons during the winter months. In the same city a chemical analysis of the atmosphere made on a calm day revealed the astonishing fact that four-fifths of the total amount of smoke was of domestic origin.

Secondly, a very large amount of unnecessary smoke is produced by factory chimneys, bake-houses, etc. Much can be done to minimise such pollution of the atmosphere, and a comparison between the fumes discharged from two factory chimneys, one where no precautions are taken, and the other where improved methods of construction and firing are in effect, is most striking. Speaking generally, very little has yet been done to prevent factory smoke.

Thirdly, the railway is a great offender, as anyone living near to a busy railroad will testify. In this case the smoke is mixed with steam, and this mixture seems more harmful and unpleasant than smoke in any other form.

Lastly, we have the nuisance caused by the excessive emission of smoke from steamboats. On the River Mersey constant supervision is exercised over the production of smoke by vessels, otherwise a serious nuisance would result. The furnaces of tugs and ferry boats require careful firing if little smoke is to be produced. It is unfortunate that under the existing law foreign-bound vessels may emit as much smoke as they please while in the river prior to their departure.

It should be noticed that ordinary estimations of the amount of smoke are made during the day-time, and observations made for the purpose of enforcing the law are invariably made during daylight. There is some reason to think that wilfully negligent persons take advantage of this fact and produce smoke to their hearts' content during the darkness, escaping in this manner the vigilance of those charged with the suppression of the nuisance.

EFFECT OF SMOKE.

The effect of smoke may be roughly divided into its action on (a) human beings, (b) on vegetation, and (c) on buildings, etc.

In the first place, it is not easy to prove that smoke has a directly injurious effect on the health of human beings. In a paper read before the Manchester Congress of the Smoke Abatement League in 1911, Dr. Niven showed that the deaths from respiratory diseases were in direct proportion to the amount of fog in the winter months. To this may be added the views held by most medical officers of health and those in a position to give an opinion on the subject, viz., that a smoky atmosphere is not without danger to the health of the community breathing it. It is well known that an atmosphere polluted with smoke and fog is exceptionally trying to those subject to or suffering from

bronchitis, asthma, and phthisis. It is difficult to get further than this, and there is scope for scientific enquiry into the whole subject from a medical point of view.

A smoky atmosphere can be easily shown to affect health indirectly. To take a simple illustration: it is difficult to secure adequate ventilation of sitting rooms, and especially bedrooms, when the air admitted is so filthy that it causes disfiguration and damage to drapery, furniture, decorations, etc.

Again, a smoky atmosphere interferes with the beneficial disinfectant action of sunlight. Not only are the hours of bright sunlight diminished by the suspended matters in the atmosphere, but the intensity of daylight is much reduced. Professor Cohen, of Leeds University, has shown that between 25 and 40 per cent. of useful daylight is cut off by the smoke of Leeds. In these observations the amount of daylight was determined by the amount of iodine liberated from an acid solution of potassium iodide, the ordinary sunshine recorders being discarded, as they take no account of the intensity of light below a certain limit of brightness.

From a hygienic point of view, preventable loss of daylight should not be allowed to occur. In addition to the depressing effect on the human mind of such gloom, poor daylight causes much discomfort and eyestrain to those engaged in various arts and crafts, often rendering necessary the use of artificial illumination, an accompaniment of which, in many cases, is pollution of the air of the work-room by the products of gas combustion.

The destructive effect of smoke on vegetation and buildings is considerable and, from an economic point of view, important. This is a matter which scarcely comes within the province of the Sanitary Authority, but a large amount of attention has been focussed of late years on this aspect of the question, and there is a growing literature dealing with it.

PREVENTION.

Turning now to prevention, we should at the outset recognise that, as in so many other matters of public health, public opinion will be found necessary before much reform can be accomplished. In many instances Local Authorities take no interest whatever in the subject of Smoke Abatement, and if individual members thereof are approached by the medical officer of health on the matter, the reply is frequently to the effect that "the more smoke the greater the prosperity of our town." Other

authorities, more enlightened, seek to control the nuisance by an occasional prosecution under the Smoke Clause of the Public Health Act, 1875, but such prosecutions, in the absence of public opinion on the matter, frequently fail and fall into disuse, especially when heard before lay magistrates.

However, in some places considerable activity is displayed in regard to the enforcement of the existing law, and with excellent results. In Liverpool, cases of this nature are dealt with under a Private Act¹ in which the adjective "black" does not qualify the phrase "smoke so as to be a nuisance." Consequently cases taken to the police court rarely fail. The Private Act just referred to also covers "grit" discharged from chimneys, a very useful provision.

It must be remembered, however, that the law does not help us to exercise any control over the greatest offender—the domestic chimney—and we may also remind ourselves that no steps, so far as I am aware, are taken with reference to smoke emitted from factory chimneys during darkness.

FACTORY SMOKE.

A great deal can be done to minimise the nuisance arising from factory smoke. Those competent to pass opinions on this subject assert that in practically all cases the emission of unnecessary smoke is the result of (1) defective boiler construction or (2) improper firing methods.

This is scarcely the time or place to enter into the details of this subject, as it is a matter really for the engineer and not for the medical officer of health. We may note, however, that granted certain principles of construction, a boiler may be constantly maintained at working pressure with the production of scarcely an appreciable amount of smoke. The difficulty is to find the men who have (1) been trained in the art of scientific firing, and (2) who will at all times carry out the instructions given during such training. There is a general tendency among engineers to leave the question of "boiler control and firing" to unskilled and often badly paid men. This ought to be corrected. The engineer should pay closer attention to the boiler and to those charged with the care of the furnaces. Attempts should be made to improve the position and pay of firemen.

With a view of stimulating interest in this subject, classes of instruction for engineers and firemen have been introduced in a few towns,

and the results have been encouraging. The experiment has been tried in London, Glasgow, Liverpool and other places. In London the classes have been provided by the Borough Polytechnic Institute, and at the conclusion of the course an examination, partly written and partly *à la voce*, is held, the successful candidates being granted a joint certificate by the Institute and the London Coal Smoke Abatement Society. These certificates are greatly valued by the men and recognised by employers as a mark of proficiency. In the interests of public health it is desirable that these courses should be encouraged by local sanitary authorities and brought before the notice of manufacturers. It would be a step in the right direction if all persons seeking employment as engineers and firemen were required to produce such evidence of knowledge. A pleasing feature in connection with the Liverpool classes has been the co-operation of large firms: in many cases firemen and assistant engineers attended the classes at the expense of the firms employing them. The economic side of the question only needs to be emphasised for such classes to be a success.

The increasing popularity of electric motors and gas engines is beginning to have its effect on the output of factory smoke. The factor which largely determines the use of such power is the cost of electricity and gas. Where these products are supplied at cheap rates there is every encouragement to their extensive use. In many places, however, the cost remains excessive, and it is a question of considerable importance how far, if at all, profits from such undertakings should be devoted to the relief of rates, rather than applied to the cheapening of electricity and gas respectively. At the recent International Congress on Smoke Abatement opinion was sharply divided on this question. Some representatives of local authorities urged that all profits should be absorbed by the undertakings, whilst others pointed to the rapidly increasing burdens of the ratepayer, and viewed with alarm any proposal to interfere with such relief of the rates.

DOMESTIC SMOKE.

Having noted the large proportion of smoke poured into the atmosphere by the domestic chimney, let us consider the prevention of such smoke. At the outset, it may be said that the problem presented here is difficult of solution when compared with factory smoke. Probably none of us are free from the British love of a brightly burning sitting-room fire, and we

cannot preach other methods of warming apartments with much acceptance. I should, however, like to draw attention to one important question in regard to household smoke, and that is the construction of fire-places and flues. Old-fashioned grates, with much ironwork and perpendicular backs, allow large quantities of consumable smoke to pass up the chimney, whereas the newer forms of grates—of which there are numerous examples on the market—with their firebrick lining and sloping backs, allow of the complete combustion of a large proportion of opaque smoke emitted from coal fires.

The inner surfaces of domestic flues are commonly left exceedingly rough with projecting mortar, etc. Such roughness prevents free draught and leads to copious deposits, which are from time to time projected into the atmosphere with unpleasant results.

These facts naturally suggest that the Local Authority should make bye-laws allowing them to inspect and supervise the construction of domestic fire-places and chimneys, in order to see that the principles of smoke prevention are observed as far as possible.

Measures designed to encourage the use of gas cookers and water heaters will produce useful results. Nowadays many gas companies and corporations fix gas cookers free of charge, and lend them out on hire at cheap rates. The cleanliness and precision of control associated with gas cooking have already done much to popularise gas cookers, but the factor which chiefly determines their use is the price of gas. During recent years electricity has been introduced into the kitchen for cooking purposes, and with great success. Many ingenious electric ovens, ranges, irons, etc., are on the market, but so far the excessive price of these articles has stood in the way of their general adoption.

During the last few years great improvements have been effected in connection with gas fires, and much prejudice against their use has been removed. If properly fixed and used under hygienic conditions gas fires are economical and satisfactory. They are specially suitable for bedrooms and rooms, occasionally used. The various gas undertakings have done a great deal for smoke-prevention, and the extent to which they have assisted in this matter may be estimated when it is mentioned that in the Metropolis alone no fewer than 1,300,000 cooking and heating appliances are now served by the gas companies.

The use of anthracite, a smokeless fuel, has increased by leaps and bounds of late years. Great improvements have been effected in the construction of stoves designed to burn this fuel, and good stoves can now be obtained at a reasonable cost. Coke is a smokeless fuel of great calorific value, but it is little used on domestic premises. The bulky nature of the fuel, the difficulty with which a coke fire is lighted and the inferior quality of coke supplied from some gas works have all hindered its extensive use.

The more general employment of anthracite and coke for domestic purposes would not be without beneficial results on atmospheric purity.

An extremely interesting paper appeared in the *Journal of the Royal Sanitary Institute* for June, 1912, in which Dr. Herzfeld described a well-thought-out plan for a combined hot water and electricity supply for private houses. Although the idea appears to be primarily designed to meet the increasing difficulties of the domestic servant question, the scheme is sound in scientific principle, and would, if generally adopted in large towns, materially assist in the diminution of smoke. Dr. Herzfeld draws attention to the popular idea that hot water, as we generate it at present, does not cost anything, as the boiler is heated by the waste gases of the kitchen fire. As a matter of fact it costs a great deal, and it is stated that the kitchen fire has a "shockingly low calorific effect, which hardly exceeds 10 per cent." It cannot be doubted that the constantly burning kitchen fire is a great offender in the production of smoke. The article proceeds to give particulars of the capital and running cost of an installation, together with a full description of the plant and method of use. The system is specially suitable for the use of flats and town houses generally, and may be commended to architects and builders.

PUBLIC OPINION.

Reference has already been made to the pressing need for public opinion on the subject.

We have in this country two excellent societies whose objects are to a great extent the stimulation of public interest in the question.

The London Coal Smoke Abatement Society was formed in 1899, mainly through the efforts of Sir William Richmond, in consequence of the great prevalence of factory smoke in London owing to the failure of Local Authorities to put into operation the law affecting excessive

smoke production. This society, by stirring up Local Authorities, organising public lectures, demonstrations and exhibitions, has performed much useful work, which has been reflected in the improvement of the air in the sphere of its operations.

The Smoke Abatement League of Great Britain, whose supporters are chiefly drawn from the North, aims at similar objects. At the present time much interest centres around a Bill promoted by this society to amend and extend the existing Smoke Clauses of the Public Health Act, 1875. This Bill² proposes to make it an offence if black smoke, or smoke of any other colour, in such quantities as to be a nuisance, is emitted from furnaces, etc. The Bill seeks to increase the fines for offences of this nature, and proposes the establishment of Smoke Abatement Authorities in districts where the Local Government Board is satisfied that the Local Authority concerned does not or cannot discharge duties with regard to smoke abatement. Section IV. of the Bill provides for the appointment of duly qualified smoke inspectors in the district of every Local Authority or Local Smoke Abatement Authority. Section V. imposes on the Local Government Board the duty of contributing to the salary of local officers and provides for central control by the Board where Local Authorities are unwilling to take action.

This Bill, however, has shared the fate of many other private Bills, and its consideration has been postponed on account of the present congestion of Parliamentary business. From a public health point of view the Bill should, I venture to think, be supported. In districts where the observance of the existing law is enforced Local Authorities will have nothing to fear, and the proposed further powers conferred on them will be welcomed. On the other hand, negligent authorities will be forced to take action in this matter if the Bill becomes law.

The London County Council in 1910 applied to Parliament in order to secure an amendment of the law with regard to the smoke nuisance, but strenuous opposition was offered by several public bodies, and the Parliamentary Committee were not prepared to give the County Council more than a nominal increase of its powers.

A great deal can be done to educate the public by means of popular lectures. This aspect of the question has received much attention in Glasgow at the hands of the municipal Atmospheric Pollution Committee.

The possession by a Port Sanitary Authority of a thoroughly equipped disinfecting station is a valuable asset. In Hull, where the local health committee own a disinfecting station, arrangements have been made for its use by the Port Sanitary Authority for a fixed annual sum. A ship's crew is removed to undergo bathing and disinfection, and their vessel (including the crew's quarters) is also disinfected during their absence therefrom.

In the case of the discovery of an emigrant suffering from scarlatina, diphtheria or measles, the whole family is detained and removed to hospital as a precautionary measure.

The clothing and effects of all deceased seamen should be thoroughly disinfected prior to their being handed over to the Board of Trade,

Under these regulations, the medical officer of health, if he has reason to believe that any ship is "infected" or "suspected to be infected" with cholera, yellow fever or plague, visits and examines such ship, and gives a certificate stating whether the ship is or is not infected with the disease. Every person on board is examined, and in the case of any person suffering from cholera, yellow fever or plague, or from any illness which the medical officer of health suspects may prove to be cholera, yellow fever or plague, the patient, if his condition admits, is removed to hospital, and instructions are given to the master as to the obligations devolving upon him. No person is permitted to land unless he gives his name and place of destination, and his address



EGG-SORTING.

and a certificate furnished by the medical officer of health, certifying that such disinfection has been carried out.

If, on the arrival of a vessel, the master reports having on board the dead body of a passenger or of a member of the crew, an inquest and post-mortem is invariably held.

These precautions are sufficient to deal with the ordinary infectious diseases—smallpox, scarlatina, measles, etc., where it is not necessary to detain a vessel, but with cholera, yellow fever and plague other powers are required, and regulations dated the 9th November, 1896, and revised regulations dated the 9th September, 1907, have been made by the Local Government Board with regard thereto.

at such place. The particulars are transmitted to the local authority of the district in which the place of destination of such person is situate.

If a ship is not ascertained to be infected, but has passengers on board who are in a filthy or otherwise unwholesome condition, such passengers are not allowed to land unless they give their names, addresses and places of destination.

Our ports are subjected to great dangers by the large alien traffic landed thereat. Alien passengers are inspected immediately on their arrival.

According to the annual report for 1911 of H.M. Inspector under the Aliens' Act, the number of aliens arriving in Hull was 47,136, 39,730 of whom were transmigrants. The sub-joined information shows the ports of departure

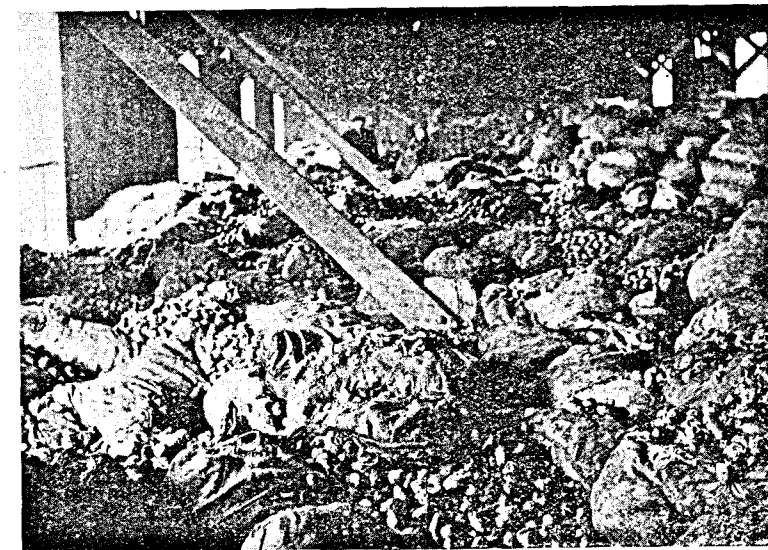
from the United Kingdom of those transmigrants who made Hull their port of arrival:—

Liverpool	...	...	32,381
London and Southampton	...	...	4,646
Glasgow	...	...	1,852
Bristol	...	...	580
Dover	...	...	264
Other ports	...	...	7
			39,730

The remainder—7,406—stayed in this country. The total number of transmigrants arriving in the United Kingdom during 1911 was 89,202, a decrease of 51,151 compared with 1910. H.M. Inspector is of opinion that "the marked decrease was due to the somewhat depressed industrial conditions prevailing in the United States."

Regulations as to the precautions to be taken

concentrated with a view to the suppression or limitation of their numbers. Any unusual mortality amongst rats should be notified to the medical officer of health in order that enquiries may be made into the circumstances, and for a bacteriological examination to be made with a view to the diagnosis of the disease. Whilst ships are in dock discs are attached to the moorings or the ropes are tarred, so as to prevent rats gaining access to the docks and warehouses. The great need for precautions with regard to rats is often emphasised by the experience of Port Sanitary Officials. For instance, in 1908 twenty-nine dead rats were discovered in a warehouse on one of the docks at Hull. The bacteriological examination, which was confirmed by the Local Government Board, showed



DAMAGED POTATOES.

with regard to the importation of rags have from time to time been made.

A very necessary precaution is the pumping out of all bilge water and water ballast before an "infected" or "suspected" vessel enters the dock. Perhaps there is no question of greater importance than that of the water supply, and provision is made in the cholera, yellow fever and plague regulations for the emptying and cleansing of a vessel's water tanks. Samples of water for bacteriological examination and analysis should be taken regularly, and the result of such analysis and examination has often revealed the probable cause of disease.

Seeing that it has been demonstrated beyond doubt that rats are the common media for the propagation of plague, efforts should be

them to have died from pestis. The men engaged on the unloading of vessels from India were medically inspected and kept under observation, and their names and addresses obtained. Fortunately there was no spread of the disease.

Specimens of rats are regularly trapped and collected by our Port Sanitary Inspectors from various ships and warehouses, and are killed, disinfected and carefully packed in tin boxes and forwarded to our city laboratory.

The sanitary condition and ventilation of crews' spaces, particularly noting their communication with paint lockers, ships' stores, etc., should receive the closest attention.

In 1907, the Public Health (Regulations as to Food) Act became law. Under this Act the Local Government Board made regulations as

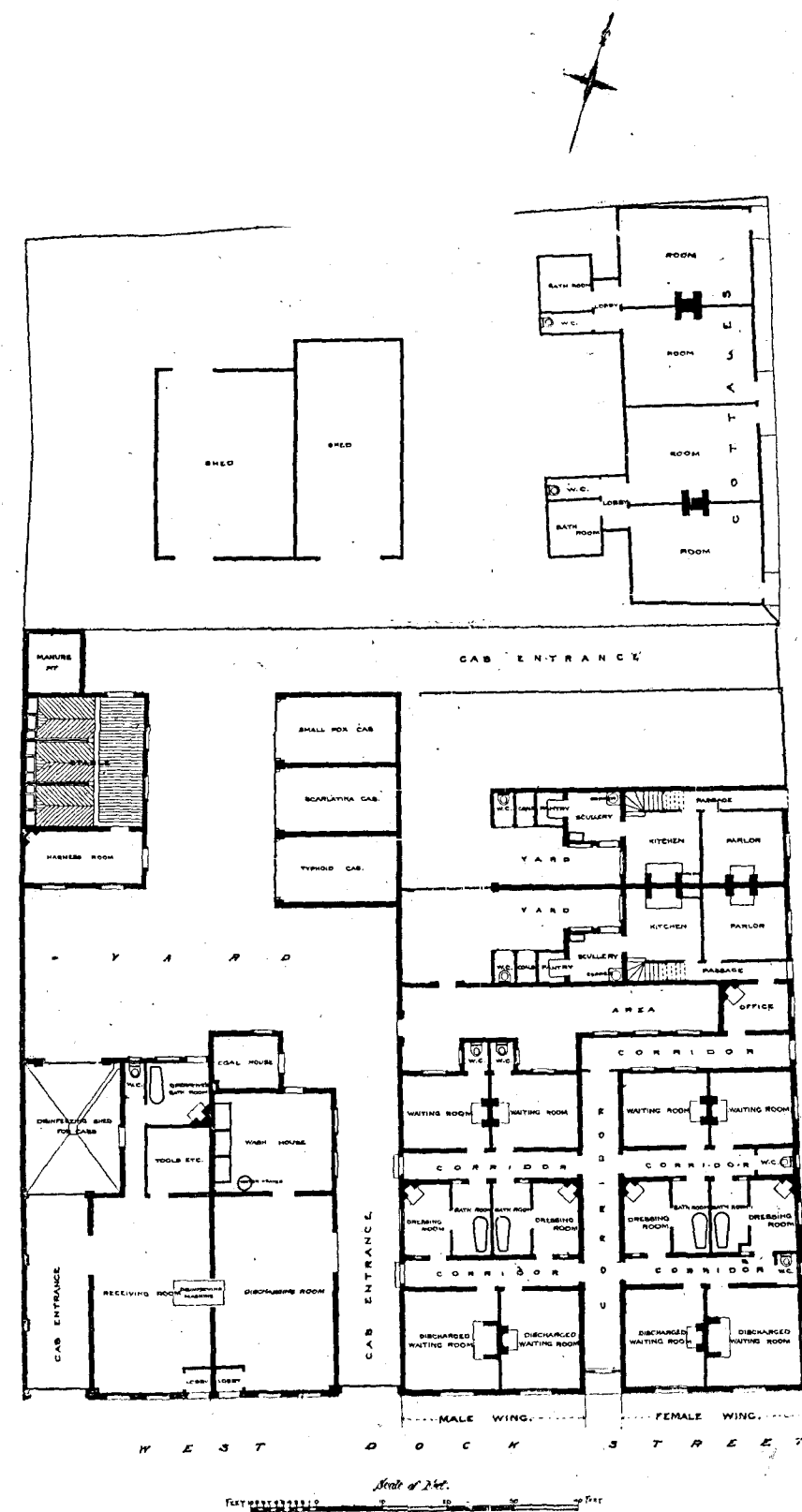
TABLE COMPARING FOOD IMPORTS WITH THE TOTAL IMPORTS AT THE CHIEF PORTS, AND SHEWING THE RATE OF INCREASE AND DECREASE.

	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.
LONDON—								
Total Imports ..	174,475,676	181,061,265	199,407,311	209,672,562	195,329,043	205,639,879	228,260,188	229,988,484
Food Imports ..	67,620,504	77,631,236	72,702,835	74,864,461	74,318,707	81,753,813	86,736,730	88,823,802
LIVERPOOL—								
Total Imports ..	137,523,276	139,295,487	146,701,650	160,405,183	140,635,000	148,596,750	170,270,246	159,914,782
Food Imports ..	49,332,556	51,313,269	52,415,178	52,740,846	47,093,893	47,389,221	46,609,863	45,446,339
HULL—								
Total Imports ..	31,858,730	32,545,886	35,537,397	39,603,363	35,338,690	39,629,597	42,282,026	41,082,231
Food Imports ..	16,775,080	17,139,857	17,429,305	19,236,215	18,192,495	20,544,060	21,298,048	21,341,277
MANCHESTER—								
Total Imports ..	21,468,225	23,290,796	26,536,274	30,402,229	25,647,640	28,943,444	29,944,605	32,502,945
Food Imports ..	4,975,415	5,024,119	5,034,009	6,496,657	6,719,134	7,971,958	7,801,734	7,625,568
SOUTHAMPTON—								
Total Imports ..	15,586,750	15,342,346	16,518,244	20,161,486	20,011,756	21,449,767	21,286,105	20,764,972
Food Imports ..	7,980,715	7,437,876	7,252,985	8,406,600	8,624,665	9,618,461	8,133,961	7,395,798
HARWICH—								
Total Imports ..	18,494,579	18,197,675	19,014,411	18,958,169	19,444,348	19,824,200	21,152,857	22,437,602
Food Imports ..	9,335,304	8,490,654	8,824,483	9,616,262	9,843,289	9,822,538	9,856,777	10,192,379
GLASGOW—								
Total Imports ..	14,946,006	14,294,421	15,396,381	15,204,846	14,250,321	14,267,670	14,533,330	15,631,149
Food Imports ..	6,617,711	7,275,100	7,600,258	7,908,289	7,105,912	7,636,454	7,099,963	7,258,822
BRISTOL—								
Total Imports ..	11,870,809	12,090,974	12,897,273	13,511,759	13,644,676	14,392,176	14,991,615	15,557,506
Food Imports ..	7,687,092	7,980,432	8,367,260	8,610,993	8,418,226	9,432,740	9,160,267	9,715,609
LEITH—								
Total Imports ..	13,255,086	12,754,072	13,628,073	13,875,588	12,883,890	13,658,737	13,559,655	15,054,221
Food Imports ..	7,694,993	7,924,342	9,501,265	8,207,456	8,556,205	8,993,122	8,335,903	9,373,759
GRIMSBY—								
Total Imports ..	10,155,209	10,687,421	11,122,293	11,112,568	10,913,713	11,489,149	12,615,959	13,544,125
Food Imports ..	3,197,668	3,165,396	3,868,395	4,329,711	4,608,242	4,489,871	4,587,246	5,141,554
FOLKESTONE—								
Total Imports ..	10,761,270	10,432,203	11,331,097	10,202,053	9,785,139	10,008,946	10,068,224	13,022,682
Food Imports ..	745,398	701,889	649,262	527,818	711,782	819,564	770,218	962,088
NEWCASTLE—								
Total Imports ..	10,055,619	9,154,268	9,893,124	10,361,305	9,423,983	9,048,035	9,442,944	9,784,592
Food Imports ..	6,146,133	5,183,216	5,235,078	6,869,940	5,573,463	5,502,492	5,424,098	5,746,806
CARDIFF—								
Total Imports ..	4,884,295	5,173,437	5,406,031	5,521,749	5,807,777	5,853,477	6,375,106	6,016,772
Food Imports ..	2,298,346	2,541,671	2,303,355	2,502,879	2,854,177	3,074,149	3,326,144	3,211,689

TABLE SHEWING THE PRINCIPAL PRODUCING COUNTRIES AND THE DIFFERENCES IN THE AMOUNTS OF FOOD IMPORTS PRODUCED FOR THIS COUNTRY IN THE SIX YEARS 1901, 1907, 1908, 1909, 1910 AND 1911.

(With acknowledgments to Dr. DEARDEN, Port Medical Officer of Health, Manchester.)

Country.	1901.	1907.	1908.	1909.	1910.	1911.
United States of America ..	61,422,052	47,573,092	45,778,612	40,171,224	32,699,978	34,413,176
South and Central America ..	11,381,108	24,652,958	34,816,805	33,880,283	34,060,384	28,101,989
Australia and New Zealand ..	10,493,772	16,208,065	13,589,758	18,466,130	24,061,388	23,666,148
Russia ..	10,321,914	15,237,744	13,301,066	21,412,390	24,821,297	23,590,160
India ..	8,908,059	15,797,659	9,548,245	15,450,329	16,852,917	19,859,235
Denmark ..	13,059,917	17,797,437	18,962,483	18,279,560	18,871,131	19,853,423
Canada ..	13,378,656	21,594,763	20,306,782	19,254,540	19,192,183	14,192,916
Germany ..	13,307,903	13,620,538	12,574,651	12,493,525	10,818,954	12,672,715
Netherlands ..	11,443,514	12,028,948	12,758,310	11,434,793	12,341,979	12,364,430
France ..	12,627,009	9,479,651	9,361,652	10,322,406	9,968,536	8,806,694
Roumania ..	2,732,003	4,028,991	2,466,997	2,614,078	2,846,684	6,064,193
Spain ..	4,636,519	5,061,713	4,613,065	4,237,767	4,867,966	5,570,148
Belgium ..	4,254,114	3,710,837	3,636,559	1,650,011	1,818,988	2,632,723
Sweden ..	1,087,828	1,638,795	1,966,987	2,068,502	2,307,549	2,550,704
Totals ..	179,054,498	208,431,191	203,681,972	212,821,538	215,529,934	214,428,660



PLAN OF THE HULL DISINFECTING STATION.

DISCUSSION.

THE PRESIDENT said that this paper was an exceedingly interesting one, and they would have listened readily if Dr. Mason had amplified his points still more. At the same time, Dr. Mason had touched upon a great many, most of them really vital points; his references to the defunct quarantine regulations and the substitution of medical inspection for them. He wondered if sanitary authorities ever stopped to consider how it was that the country remained so long free from smallpox at a time when they unhappily saw a growing disregard of vaccination. They were told that while vaccination was declining smallpox was disappearing; but those who said so failed to realise that it was to the efforts of the sanitary authorities at the ports of entrance that the disease was arrested. It probably came to this country as frequently as ever it did, but thanks to the methods adopted by the sanitary authorities it remained at the ports and did not find its way, as it formerly did, into the inland districts of the country. On arrival at the ports patients suffering from smallpox were removed to hospital, whilst contacts were cleansed, disinfected and vaccinated, and the consequence was that the country had enjoyed a very long immunity from that disease. In regard to the other formidable forms of disease alluded to, he felt very strongly that the international agreements arrived at in the Conventions held in Paris and Vienna should be rigidly adhered to. As a matter of fact it was known that they were not always, and that some of their foreign friends were apt to be scared too easily into devising preventive measures of a vexatious and useless kind. Probably they suspected that something existed that did not exist. These were matters of great public moment, and if the nations agreed amongst themselves upon a certain line of policy—to conceal nothing, but let everything be known—it was the duty of them all to abide by these regulations. This led to the extremely important question of how to deal with rats. He thought that in all parts of the country, in the inland districts as well as in the ports, the sanitary authorities were beginning to realise the important part which the rat could play in the spread of disease. Unhappily they could not rely on discs and tarred ropes to prevent rats from coming ashore from ships. It was known that rats could climb over discs 15 inches or more in radius, by first jumping up to the top of the disc and then jumping down on the other side, so that that line of defence was unreliable. The real defence was the destruction of the vermin, and an appreciation of the fact that commerce and sanitation must go hand in hand. If the shipping community only realised that, he was sure they would give every possible help in destroying these vermin. Dr. Mason had suggested the use of a uniform language for bills

of health, such as Esperanto. He was afraid they would not live to see that, but what could be done was their translation into what was after all almost a universal language, viz., French. The translation of bills of health into French was a very great facility, and the practice was becoming largely adopted. He did not know whether it was done in other English ports, but in Liverpool many shippers required their certificates in French, and they had much pleasure in giving them in that or any other language the people thought necessary. He complimented Dr. Mason on his methods of dealing at Hull with rejected emigrants and those who needed or desired disaffection, and it was to be wished that these methods were adopted in all our other ports.

DR. HERBERT WILLIAMS (medical officer of health for the Port of London), also wished to thank Dr. Mason for his admirable paper. He quite agreed with the President that it erred on the side of shortness, although he appreciated Dr. Mason's position when dealing with such a wide subject. The difficulty was that when once a man began upon it it was difficult to know where to end, and so probably it occurred to Dr. Mason to only give an outline and allow others to fill in the gaps. He agreed with the President that bills of health were as a rule put into French, but looking at the matter practically he did not think they were of much value. The information had to be obtained from the consuls; and British consuls in foreign parts, he was afraid, did not take that interest in their work which they ought to do. They were more concerned in signing and filling up forms, and looking at the value of the stamps to be imposed upon them. What was more important was the necessity for more information as to disinfection and disease in foreign ports. In this respect our own Government fell behind the United States of America, which sent out from Washington every week an admirable little pamphlet giving an absolutely authentic record of the infectious diseases which had occurred in different ports up to certain dates. Its use was invaluable, and if our Consular service were better organised we could get similar information through our Government departments. With regard to grants from Imperial funds to the Port Sanitary Authorities, it was quite true that the work done by these authorities was for the benefit of the country at large, and that the bulk of the cargoes and of the persons which were landed in London were immediately distributed to different parts of the country, and might spread infectious diseases. In London they were debarred from raising this question, as there was a clause in the Public Health Act of 1891 which provided that all the cost should be paid by the Corporation of the City of London out of its private funds, and not a penny was paid by the

ratepayers either in the city or county of London. The President had touched on an important point with reference to the International Conferences. The difficulty which this country had to fight against in entering these Conferences was this:—Foreign countries, which had not so important a maritime commerce as we had, were anxious to impose restrictions on this country, while we entered into the Conference with the desire of making the restrictions no more than was absolutely necessary to protect public health. Foreign countries were liable to judge of the state of public health by the amount of sanitary inspection done in the ports of this country. To illustrate his point he might say that if a foreign country knew that at any port in this country the sanitary authorities were not carrying out strict inspection, it would at once impose all sorts of restrictions on our commerce. And it could be imagined what that meant to the trade of ports like London, Liverpool and Hull! In these days of keen competition in the shipping industry, on a vessel's arrival in port there was a rush to get the cargo out, a new cargo loaded and the vessel sent to sea at once in order to earn money. If a ship went from England to a foreign port and the authorities there liked to say that in such a port from which it had come the sanitary authorities were not doing much in the way of medical inspection, or the destruction of rats, they could insist on that vessel being moved out into the stream, and on the holds and cargo being fumigated irrespective of any damage that might be done thereby. Further, they could insist on all the cargo being discharged into lighters, a process which would involve a whole week instead of three days, had the ship been in dock or at the quay side. All this involved additional expense and the loss of four days. That led him to emphasise the point that the port regulations which might be framed in this country must be carried out strictly to the letter, not only for the protection of our public health, but for the protection of English commerce abroad. Under the Board of Trade regulations the Port Sanitary Authorities had ample power to deal with cholera, plague and yellow fever. Ships on which these diseases were suspected could be held up, and everybody on board examined. They could insist on the names of passengers with their addresses being given and a heavy penalty could be imposed on those refusing or giving false addresses; and if the authorities were not satisfied the passengers could be detained on board. But it seemed to him that some additional powers were required to enable the sanitary authorities to deal with smallpox. For instance, a vessel might arrive from Spain after a voyage of six or seven days. Now, almost every port in Spain was infected with smallpox, but all that the sanitary authorities here could do was to ascertain

that no one on board had smallpox on arrival. Passengers might disembark and go to different parts of the country, there develop the disease and become at once the means of spreading it. He knew of a case where a man landed in London from a ship from Spain apparently quite well and went up to the vicinity of Liverpool where, the day after, the disease developed and other persons were infected by the patient. Other passengers went to Gloucestershire and Kent and developed smallpox, thus each one became a potential factor in spreading the disease. The rat question was also very important. As members were aware the Local Government Board, two years ago, issued an order which gave power to Port Sanitary Authorities in cases where there was a suspicion of plague existing either in rats or persons on board ship, to "take measures" for the destruction of all rats on board ship and for preventing rats from entering buildings on shore. In other words, they were to make the buildings rat-proof. It was very easy to make such a regulation, but extremely difficult to carry it out. In the first place what was meant by "measures"? "Measures" was a very general term indeed. It might mean giving instructions to someone to do something, or entering into negotiations with somebody to do it, or to take upon themselves the expense of destroying the rats. Some Port Sanitary Authorities were taking more active steps than formerly in destroying rats and having them bacteriologically examined. All this meant a very heavy expense to these authorities, for they could not get the examinations done for nothing. Moreover, it was dangerous work, and had to be accomplished by competent skilled bacteriologists in properly equipped laboratories; where the investigations could be conducted without the danger there would be in a private house. He anticipated that the expenditure in that respect in the Port of London would be between £400 and £500 this present year, in order to say definitely whether there was, or was not, a case of plague among the rats found in the port. There was a difficulty in preventing the rats getting on shore. They were most intelligent and cunning animals, and if they wanted to get on shore they would do so in spite of precautions. There was only one thing to do and that was that the ships should be fumigated with some lethal gas, so as to destroy all noxious life on board. It was possible that when new regulations came to be framed to comply with the conditions agreed to at the International Conference held in Paris last year, they would contain additional powers enabling Port Sanitary Authorities to deal with the fumigation of ships. In his opinion ships should be fumigated every six months, and if that were done they would remain practically free from rats during the interval between the fumigations. But this duty

ould involve great expense, for ships could not be properly fumigated by taking a few pots of sulphur down into the holds. An expensive plant was required for developing the sulphur dioxide and pumping it into every part of the ship. An extremely efficient apparatus had been recently put upon the market to draw the carbon monoxide and carbon dioxide from the funnels of steamers for fumigating purposes. These gases were first passed through scrapers to get rid of the soot, and were lethal to the rats. But they did not kill the fleas, and it was no use in having any gas which did not kill the fleas. That only added to the risk, for once the rats were dead the fleas sought the nearest living creature in order to obtain nutriment. These were the chief points which had occurred to him in listening to the paper, which was of very much interest. In reply to an enquiry, Dr. Herbert Williams said that the apparatus was the invention of Dr. Harker, a Doctor of Science of London University, who had been practising in Australia as a chemist. He had devoted his attention to this apparatus for some years, and it was in use in the United States of America at the present time. He had had a talk with Dr. Harker lately, and pointed out to him that he must evolve some means of destroying the fleas, and also make his gas safe. Carbon monoxide was an inodorous gas which was a danger. For instance, on board a large mail boat lately sulphur dioxide was being pumped into two of the holds, when there was a rush of gas through bulkheads into the men's quarters, and the smell of the gas induced the men to escape. If carbon monoxide had been used the men would not have recognised it, but would have been overcome, and have lost their lives. Dr. Harker proposed to get over the difficulty by adding carbon bi-sulphide. On one occasion when he could not get that substance he used oil of mustard, which gave the people a warning of the approach of the gas.

Mr. G. BRIGGS (Chairman of the Port Sanitary Authority of the Corporation of London) said he had accepted the invitation of the Society to come to that meeting in order that he might learn something. He fully endorsed what Dr. Williams had said regarding all that was done by the Port Sanitary Authority of the City as to the inspection of food, and the extinction of rats without any expense to the ratepayers of London. Of course so far as the medical side of the sanitary inspection of the port was concerned, he was a mere layman; but was very anxious to do his duty under the able direction of his medical friends.

Dr. M. K. ROBINSON (Dover) agreed with the previous speakers that more power was needed by Port Sanitary Authorities in dealing with infectious diseases other than cholera, plague and yellow fever, for which definite regulations exist. The regularly constituted Port Sanitary Authorities,

like Hull, were well equipped for carrying out the duties devolving upon them, and it would be desirable if Riparian Authorities were equally prepared for emergencies which might arise. At Dover, regulations for fixing a boarding station for dealing with all cases of infectious disease occurring on board vessels have been prepared and submitted to the Local Government Board for approval.

Dr. TUBB-THOMAS (Wiltshire) pointed out that the smaller ports in the country felt the pinch of lack of funds in order to promote efficiency of sanitary inspection of ships arriving there. In the large ports which had heavy port dues and other sources of revenue it might be possible for them to do without Imperial assistance; but in the smaller ports to which smaller ships resorted the danger from imported disease was very great, and some help from national funds should be given to them. It was quite possible, however, that more active and serious restriction on shipping would be resented by the shipowners. Many years ago he had something to do with a small port, but proper and efficient sanitary supervision was practically beyond their means.

Dr. HERBERT JONES said that medical officers of health received at more or less irregular intervals information from Port Sanitary Authorities that certain individuals from infected ships were coming to their district, and very likely the port authorities thought that no use was made of that information. As a matter of fact, they did make use of it, and sought out the people as far as they could, and put them under observation. He believed the port authorities did all they could to get the correct addresses of the men and women; but sometimes a person would say "Oh, I live in Bloomsbury." That was not sufficient. They could hardly trace a man by simply being given the address "Bloomsbury." If it were possible the man should be asked where a letter should be addressed to him. That would be great help to the medical officers of health in tracing the migrants; and allow of cases being followed up, and a record being kept of them, while it was an education for the people themselves.

Dr. WRIGHT MASON, in replying on the discussion, said that the object of his address was to lead to an interchange of thought and ideas. He had been much satisfied with the discussion, especially with regard to disinfection, and the new ideas suggested by Dr. Harker's experiments. It was highly necessary that the disinfection of ships should be carried out with the utmost efficiency. The President had alluded to the spread of smallpox. The only power that port medical officers of health possessed as to smallpox was that the vessel should be disinfected, and that the men should be recommended to undergo re-vaccination. The names and addresses of the

crew are taken and forwarded to the medical officers of health of the respective districts in which they reside. The men on being paid off went north, south, east and west, and he instanced one ship in which four distinct cases of smallpox developed in different parts of the country after the men had been disinfected and received their discharge. There was difficulty with regard to emigrants from the Continent, who were a great source of anxiety. Take the case of Russian Jews who came to Hull from Libau. On disembarking at Hull they departed immediately for Liverpool. Some might develop smallpox at Libau, some at Hull, and others only after arriving at Liverpool. Some time ago he made inquiry as to the accuracy of the names and addresses of persons arriving at Hull. He always asked for postal addresses, and taking them all together he found that they were fairly correct.

A WATER-BORNE EPIDEMIC OF TYPHOID FEVER.

By Dr. DANTE DE BLASI. *Annali d'Igiene Sperimentale*, Vol. 22, Page iii, 1912.

THE writer gives an interesting account of a serious outbreak of typhoid fever occurring in March, 1912, in Albano, involving over 460 people, and due to a leak in the joints of the water-conduit supplying the district. The leaking point was in close proximity to a house occupied by one who had been ill with typhoid fever two or three weeks before the beginning of the outbreak, of which therefore he was presumably the source.

The nature of the epidemic was recognised bacteriologically before the symptoms were sufficiently clear for a clinical diagnosis. Blasi is enthusiastic regarding the value of direct culture of the organism from the blood as a valuable means of diagnosis. A study of his series of 29 cases examined by culture and by serum reaction simultaneously shows, however, that, of duplicate samples of blood, 17 gave a positive serum reaction (Widal's test) as against 11 which gave typhoid bacilli in culture. The culture tests afforded no clear indication that they gave positive results at an earlier stage of the disease than did the serum test.

THE CHILD WELFARE CODE of the State of Ohio, U.S.A., includes the following enactments:—"All children attending any of the public schools of the State of whatever grade shall be inspected as to their physical condition, including their lungs, at least once during each school year. Teachers having positively open pulmonary tuberculosis or other communicable disease cannot be re-employed at the expiration of their contract—they may be suspended pending recovery.

ERRATUM.—*Human Tubercle Bacilli in the Milk of a Vaccinated Cow*, p. 176. Third line from bottom of first column should read "four days old."

THE PLAYGROUNDS OF PUBLIC ELEMENTARY SCHOOLS.

REPORT OF THE DEPARTMENTAL COMMITTEE.

THE terms of reference to this committee, which included amongst others Sir George Newman, chief medical officer to the Board of Education, were to determine whether or not the standard of playground accommodation, viz., 30 feet per head of accommodation, should be modified according to the size, design or situation of the school, the proximity of recreation grounds or open spaces, the density of the population, the cost of land or otherwise; and how far it is desirable to define more precisely the standard of playground accommodation, or to regulate the practice of the Board of Education in dealing with cases in which the playground accommodation is considered to be insufficient.

Having heard a number of witnesses, a few of whom were medical men, the committee have reported and made a number of recommendations.

In the case of new schools they advise that the shape of the playground should be more carefully scrutinized, and that passages, forecourts, etc., should not be counted as forming part of the minimum space required. Except in very small schools, playgrounds should be separate for boys and girls, but playgrounds for girls and infants need not be separated provided the area is sufficient for the total number of children.

If other provision is made for games, an undivided playground should provide 20 square feet for each older child and 16 square feet for each infant. If there are less than 200 children the provision should be 2,000 square feet, plus 10 square feet for each older and 6 for each younger child.

An undivided playground where there is no other provision for games should give, when the children number over 200, 30 square feet and 16 square feet per head of the older and younger children respectively. If the numbers do not reach 200, there must be 2,000 square feet and 20 square feet for each older and 6 square feet for each younger child.

When a site is expensive the Board of Education should be allowed to grant modifications, but each case is to be treated on its merits, and though measurements less than those for the undivided playground when no other provision for games is made may be allowed, nothing less than those stated for the undivided playground with other provision for games is to be permitted.

In the case of the existing school it is recommended that every school should have space for each class to take its lessons in physical exercises in the playground or an equivalent space. After 1920 a playground allowing less than 10 square

feet for each child should be classed as "insufficient," and after 1925 one allowing less than 15 square feet per child should also be so classed.

Enlargement of buildings, except in special circumstances, should not be allowed if it would reduce the playground below the limits given for undivided playgrounds. Reduction of playground below these limits by the erection of buildings for special subjects should not be allowed.

Generally the committee express themselves as in favour of a roof playground. If it covers virtually the whole of the building it is recommended that it should be regarded as satisfying the requirements of the children, other than infants, occupying one floor.

Travelling outside the terms of the reference from time to time, the committee encountered and refer to some other points of interest. On the question of the surface of playgrounds, for example, they discussed very fully the various substances used, and eventually came to the conclusion that there must be a hard surface of sufficient area for a class in physical exercises, and that in large schools and populous neighbourhoods tar-paving, which is, in fact, usually adopted, is the best. In smaller schools in country districts, though a hard surface is necessary, a really good gravel surface is not unsuitable. The draining of the playground should, it is also suggested, be towards the edges of the playground where gulleys would not interfere with play.

In the matter of closet accommodation and water supply, the committee, though they make no recommendation, seem to be in agreement with those witnesses who alleged that the Board's minimum requirements with regard to the former are too low, and that the latter is often insufficient, with the result that there is crowding and disorder.

Some remarks in favour of the use of the playground for open-air classes—which, it is pointed out, is not the same thing as an open-air school—and during holidays are also included in the committee's report.

"CHARMING."—The practice of "charming" as a remedy for disease has not yet entirely disappeared. In two instances, the "charmer," a woman, was employed to cure ringworm of the scalp. A third patient had erysipelas, and the "charmer" was a man. So far as I could make out the performer had chanted mystic rhymes and touched the affected part three times, and in none of the cases had he or she apparently considered it necessary to wash his or her hands either before or after the ceremony. In each case the "magic" failed, and medical treatment had to be obtained.—*Durham County Council. Annual Report of the School Medical Officer, 1911.*

INDIA.

PROGRESS OF MILITARY SANITATION.

THE average strength of European troops serving in India during 1911, says *The Times*, is returned as 72,371 warrant officers, non-commissioned officers, and men. This year's report on their health is the most favourable one ever recorded, and constitutes a record under all heads, except for a small fractional rise in the death-rate from all causes over that returned in 1910. The chief features are shown in the following table:—

All Causes.	Ratio per 1,000 of strength.		
	1905-09.	1910.	1911.
Admissions	802.5	576.5	524.7
Constantly Sick	47.26	31.93	28.81
Deaths in the Command	8.79	4.66	4.89
Invalids sent home	19.92	7.75	7.07
Invalids finally discharged	8.99	6.51	—
Average sick time to each soldier	17.25	11.66	10.58
Average duration of each case of sickness	21.50	20.22	20.05

The death-rate per 1,000 for 1911 was 4.89, compared with 4.66 in the previous year. This slight increase was accounted for by a number of heat strokes due to the exceptionally severe hot weather, and to a slight increase in the number of deaths from cholera and plague.

The number of cases of enteric fever is the lowest on record, being 170 with 22 deaths. As in 1910, a differentiation has been carefully made during 1911 between the classical enteric fever and the disease known as paratyphoid fever. Before 1910 no such differentiation had been made, and the returns for earlier years under the heading of enteric fever include probably cases of the then unrecognized paratyphoid fever. For 1911 the returns show 104 cases of paratyphoid fever with two deaths. The figures quoted in the report show that against true enteric fever the value of inoculation is most marked and the case in favour of the procedure much strengthened by experiences gained during 1911. The disturbing factor is the prevalence of paratyphoid fever, against which disease anti-enteric inoculation appears to have little influence. This view was hinted at in the previous year and emphasizes the plea for a poly-valent, or rather a bi-valent, emulsion with which inoculation could be carried out against both diseases. The re-inoculation of men after a lapse of 30 months since their primary inoculation is being steadily pressed and meets with an encouraging support from all ranks.

Under the heading of malaria it is stated that there were 3,045 fewer admissions than the previous year, but this is chiefly due to fortuitous causes, such as a small and irregular rainfall. The Director of Medical Services in India states that "We have made strenuous efforts to develop the use of nets among troops, with some success, but much more

needs to be done in this direction. The universal and systematic use of netting by troops, especially in malaria districts, constitutes our only sure means of defence against this scourge, but, like many cognate questions, its execution depends upon financial help from the State; so far our efforts to secure this have failed."

Venereal diseases still account for about 10 per cent. of the total admissions to hospitals, but, although they have caused as many as 3,842 admissions during the year, there is a definite decrease as compared with former years. In 1907 the admission rate per 1,000 for all forms of venereal diseases was 89.9, and in 1911 it was 53.1, and there is distinct evidence that this decrease is in a great part due to the improved moral tone of the army.

APPOINTMENTS.

FLEET-SURGEON ANDREWS, of St. Briavels, has been appointed medical officer of health and inspector of schools for the combined areas of the Awre, Newnham, and Westbury Rural Councils and Gloucester, Lydney, and East Dean Urban Councils.

DR. MARTIN ASHLEY, medical officer of health for the East Gloucestershire United Districts, has also been appointed school medical officer.

DR. L. T. BURRA has been appointed tuberculosis officer for Buckinghamshire.

DR. GEO. LISSANT COX has been appointed tuberculosis officer for the county of Lancashire.

DR. DAUKES, of Beckenham, has been appointed medical officer for the county of Essex.

DR. W. H. DICKINSON has been appointed tuberculosis officer for the city of Newcastle-on-Tyne.

DR. J. FAIRLIE has been appointed school medical officer to the Blyth Education Committee.

DR. R. FRASER has been appointed tuberculosis officer and assistant medical officer of health of Derby.

DR. ALEXANDER R. JOHNSTON, M.A., M.B., Ch.B., Montrose, has been appointed medical officer of health for the burgh.

DR. KIRK has been appointed medical officer to the Pickering Urban District Council in succession to the late Dr. G. W. Robertson.

DR. HENRY C. T. LANGDON, medical officer for the borough of Mansfield, has accepted an appointment on the medical staff of the Board of Education.

DR. JAMES M. MACLACHLAN, of Blyth, has been appointed medical officer of health to the Blyth U.D.C.

DR. ELIZABETH M'VAIL has been appointed a medical assistant in the Public Health Department of the London County Council.

DR. ARTHUR H. NORRIS has been appointed tuberculosis officer under the Insurance Act by the Berkshire County Committee.

DR. SHEILA MARGARET ROSS, M.D., of Manchester, has been appointed assistant medical officer of the borough of Richmond, Yorkshire.

DR. RALPH DAVIS SMEDLEY, assistant medical officer under the Durham County Council, has been appointed assistant medical officer for Leeds.

DR. E. BERTRAM SMITH has been appointed medical officer of health for the newly-formed North Essex combined districts.

DR. W. S. STALKER has been appointed medical officer of health for Swinton and Pendlebury.

DR. D. J. THOMAS, of Bargoed, has been appointed medical officer of health to the Gelligaer U.D.C.

DR. J. L. THOMAS, medical officer to the Brynmawr U.D.C., has been appointed medical officer to the Nantyglo and Blaina U.D.C.

DR. G. L. TUCK (WU LIEN TEH), M.D., B.C. Cantab., has been appointed director and chief medical officer of the North Manchurian Plague Prevention Service, with headquarters at Harbin.

REVIEWS.

Report to the Local Government Board upon the "Biological Properties" of Milk, both of the Human Species and of Cows, considered in Special Relation to the Feeding of Infants. By Janet E. Lane-Claypon, M.D., D.Sc. (Lond.). Published by His Majesty's Stationery Office, London, 1913. Price 9d.

Dr. Lane-Claypon is to be complimented upon the production of a painstaking and laborious report, in which some important conclusions are reached that will doubtless be accorded due publicity and commendation. A very full bibliography is appended that will be of considerable value to those who are engaged in the pursuit, in laboratories, of relevant lines of enquiry.

The concluding paragraph of the report proper runs thus:—"The investigation of the biological properties of milk carried out shows that the weight of evidence suggests the absence of any direct value in the biological substances *per se*, but it also most decidedly shews the paramount importance of providing breast milk for the young animal." Now these few lines, like the word "politics," comprise in themselves a study of no inconsiderable magnitude.

Dr. Lane-Claypon apparently is willing to explain the paramount importance of breast-feeding by an appeal to merely chemical findings; but does not give us any definition of biological substances, and we are left to assume that they are those that exercise, or possess biological properties. In a rough and ready sort of way, we may suppose biological substances to be those whose presence or absence is usually determined by methods of investigation other than the chemical or physical processes generally employed in analysis. Yet in a strictly philosophical sense, the term "biological" is, in this connection, as question-begging an epithet as are, for the matter of that, the words "chemical" and "physical." As, however, the range of chemical and physical investigation becomes extended, the unknown biological, or ultra-chemical end of the spectrum, so to speak, becomes lessened, and we realise the impossibility of drawing a clear line of distinction. Dr. Lane-Claypon, doubtless in full realisation of this difficulty, attempts, as we have said, no definition: on the other hand, however, she, a little arbitrarily, it seems to us, says that the group of "biological substances" is formed (1) by the ferments, and (2) the protective substances. There is no reason whatsoever why the scope of this enquiry should not have been limited to the consideration of these two sets of substances; but, since the whole class of hormones, and the hardly less important group of vitamins, are designedly placed on one side, it is well to remember that Dr. Lane-Claypon's conclusions and investigations do only apply, on the one hand to (1) the oxidases, catalases and the like, and on the other to (2) the hæmolysins,

agglutins, antitoxins, and so forth. In respect of the former category—that of the ferments—it is concluded that such as are found in human and cow's milk have little biological value—that they do not play any "vital" part in the conduct of nutritive processes; and, in particular, it is insisted that the ferments of cow's milk are, in great measure, the products of contained bacteria. In respect of the protective substances of milk (the hæmolysins, and their congeners) the scope of the enquiry has again been narrowed down. All consideration of the antigens has been excluded, for the rather curious reason that an investigation of the biology of milk, in relation to them, "leads at once into the most subtle and complex branches of biological research" and that it was thought well "to concentrate as closely as possible upon the bearing of the question on the feeding of infants." For ourselves, having been always impressed by the relation between the processes involved in defence, and those involved in nutrition, as postulated by Ehrlich, we should have thought it difficult to consider the feeding of infants in this way without the discussion of "antigens." Moreover, as Laroche and others have pointed out, there is good reason to believe that many cases of difficulty in rearing children on cow's milk are due to anaphylactic sensitisation of the infant in respect of that substance, or rather, of its proteins. However, after consideration in this restricted way of the "protective substances," the conclusions set out at the commencement of this review are given, followed, with great candour, by a note on the "vitamines"—those substances which, *in absentia*, are now held responsible for the occurrence of scurvy, scurvy-rickets, beri-beri, and other forms of zeism. That these substances are thermo-labile seems hardly to admit of doubt, but it is not known whether it is they, or their "properties," that are destroyed by heat. There can be, however, little doubt that it is partly because of the specific nature of vitamins that breast-feeding is of the paramount importance to the young infant that Dr. Lane-Claypon justly declares it to be, and, this being so, it is really a mere logomachy to discuss whether or no these vitamins have "biological properties" or are "biological substances"; *per se* or otherwise. The fact is that we, in the case of these vitamins, are concerned with substances that may be actively present in one, and absent from another compounded food, made up in accordance with a chemical prescription. Doubtless they have a chemical formula, but they have not yet been produced save by the direct action of living tissues. Two years ago we knew nothing of them—a fact which should give us pause if we are inclined to think that the ferments and protective substances, together even with the hormones and the vitamins (the two groups of

substances excluded from the report proper) account for all the ingredients in milk that may be called "biological." It is because of Dr. Lane-Claypon's deserved reputation that, at the risk of seeming desirous to labour the point, we must insist on the self-imposed limitations of the report, and would ask the reader, as we are sure the author would wish, to bear in mind the "terms of reference." Otherwise there is the possibility that, in cases where breast-feeding is impossible, recourse may be had to artificially prepared substitutes, lacking the still intangible properties that for want of a more descriptive term we call biological, and that distinguish all made in Nature's laboratory from anything made in man's.

F. G. CROOKSHANK.

SCLERO-CORNEAL TREPHINING IN THE OPERATIVE TREATMENT OF GLAUCOMA. By Robert Henry Elliot, M.D., B.S., London, F.R.C.S. Lieut.-Col., I.M.S. London: George Pulman & Sons.

In recent years great attention has been paid to the operative treatment of glaucoma. The ophthalmic surgeon has been well satisfied with the usual mode of operating for acute glaucoma. Since v. Graefe instituted his wide iridectomy there have been few who have ventured to suggest any possible improvement on his methods, and fewer still who have wished to carry out any such innovations. But it has been quite otherwise with chronic glaucoma. It is a fell disease, all the more dangerous, because it is so insidious. The sufferer rarely knows when he first begins to suffer from its effects, and does not realise that he is in any danger of a grievous and possibly total loss of the sense of sight. Too often its early symptoms are put down to old-age-sight, to neuralgia, to bilious attacks, and such ordinary states.

Until recent years treatment has been most unsatisfactory. Operative measures have proved so poor in result that most were content with the purely palliative exhibition of eserine. Within the last few years a totally different condition of affairs has arisen. Lagrange in France and Herbert in India showed that it was possible to secure a definite and apparently continuous reduction in the tension of these eyes by providing a safety valve cut through the substance of the sclerotic. No sooner was this realised than many other means of securing the same effect were devised, put into practice, and published.

This book of Elliot's is a statement of his experiences of one of these new operative measures: a particular mode of trephining the eyeball and making an iridectomy. Elliot describes the mode of operating, and the results he has obtained with a nice clearness, and with an enthusiasm of style that is very captivating. The method has been tried by many surgeons at home and abroad, and there is no doubt that it will do all that is claimed for it. At the present the one thing

wanting is the certification of time. Which of the many operative measures will secure these good effects for the longest time? And, more important still, will any of them secure these effects for the whole life of the patient, say for twenty or thirty years?

N. BISHOP HARMAN.

EYE-STRAIN IN EVERYDAY PRACTICE. By Sydney Stephenson, M.B., C.M., Edin., etc. London: The Ophthalmoscope Press, pp. 139. Price 3s. 6d. net.

This little book is the summation of a series of articles that have been published by the author in several medical magazines during the last ten years, and it also includes the Middlemore Lecture delivered in Birmingham in 1910.

The subject with which the author deals is essentially one that bulks largely with the civilized community. Those who live in towns become hyperæsthetic. We are constantly subject to stimuli, both mental and physical. Our minds are excited by the rapidly shifting drama of the news. Our ears are never at rest from the continuous roar of the traffic. Our eyes are assailed at every turn by the dazzling intensity of new and terrible high-pressure lighting systems, the exposure of which to the unprotected gaze of the public eye ought to be made a punishable offence. With such things as the normal experience of the townsman, the "civilian," it is not a matter for wonder that the population seems to be becoming ever increasingly susceptible to the irritating effects of small irregularities in the optical adjustment of their eyes. But the way the reviewer has put the matter is not the manner of its exposition by the author of this work. He treats the facts. Certain disorders are found; associated therewith are found certain errors of refraction; the correction of these errors of refraction by suitable glasses is found to be followed by a grateful relief of the symptoms. Therefore it is a good argument that like disorders in other patients should be treated in the like manner; examine their eyes, and correct the errors of refraction, or muscle adjustment, that may be found. The argument is logical, and what is more it is justified in the experience of every ophthalmic surgeon every day; and in the experience of a growing number of family physicians.

Included within the book is a chapter "on a common appearance of the optic disc liable to be mistaken for optic papillitis." It is not strictly in sequence with the title of the book, but that does not detract from the importance of the caution given in the observations recorded therein.

The author gives an altogether just warning of the necessity for the examination, by a competent ophthalmic surgeon, of persons suspected of being the subjects of the association neuroses described in the several chapters.

The book is well worthy the perusal of all medical practitioners. N. BISHOP HARMAN.

REPORT ON THE INFLUENCE OF SCHOOL BOOKS UPON EYESIGHT. The report of the Committee of the British Association appointed to enquire into this matter, presented to the British Association, Dundee, 1912. Pp. 33, price 4d.

This report is a sign of the times. Time was when any book was a treasure. Time is when we look at a book and think if it be good or bad. This has been the outcome of the commercial habit in books. It is profitable to make books, even though there is no end to the making of them; so the scramble for the profit has led to the supply of more bulk and less sense, for bulk and sensible quality have not gone together. Bargains in books are too often no gains to the readers, if the sum total of the effects of the reading be ascertained.

The report commences with a statement of the "Present Practice of Local Education Authorities in England and Wales" to secure a reasonable state of the eyes of the children. Quotation is given from a circular of the Board of Education on this matter. A letter was sent to every education authority asking them to supply any information they could as to their practice in carrying out these directions. The replies that were obtained were not all that had been hoped for, and they made very evident the necessity for some enquiry such as had been set before this committee. It is certain that the findings of this committee will obtain wide attention, and it is equally certain that good will come out of its recommendations. For one thing, education authorities will have some standard to guide them in the choice of books, and for another publishers and printers will have some knowledge of the minimum requirements in character of type and paper.

Four pages are given to a report of the Oculist Sub-committee. This report is really the answer to the question implied in the title of the whole report, for the surgeons state categorically the effects that book reading is likely to have on the pupils who indulge over much, or begin too early. Too much attention cannot be drawn to the warning given in the report of this sub-committee of the grave danger incurred in over-working the immature eye of the young child. No amount of prevision and care in the production of school books will make up for a lack of recognition of this one point. If the report does no more than drive this simple fact home to the school masters and school authorities of the country it will have earned the thanks of the next generation. Equally wise and cautious are the remarks of the doctors' report concerning the production and increase of short-sight in school years. These four pages should be in the hands of every school teacher; they are certain to be helpful, and there are no fearsome technical terms to prevent any one from understanding what is written.

The third section of the report deals with the "Hygienic Requirements with which School-books Should Conform." Separate sections deal with:

1. The psychology of the reading process.
2. The necessity for good workmanship.
3. Quality of paper required.
4. The character of illustrations.
5. The colour of the ink.
6. The mode of printing.
7. The character of the type.
8. The size of type faces and their vertical and horizontal separation.
9. Length of line.

And there follow a series of sections dealing with the requirement of books on special subjects, or in particular scripts, e.g., German, Greek, Music and Mathematics.

With the conclusions of the committee, and an appendix of notes on the technical terms of the 'printers' trade necessarily used in the report, the pamphlet ends with ten pages of specimens of types suitable for the use of children of different ages.

So far as the general findings of the report are concerned, it is a fair statement to say that the committee draws attention to the following as necessities for the making of a good book:—

1. A size of type conformable to the age of the child.
2. A width of character conformable to the height of the character.
3. A sufficient strength of outline to the type.
4. A sufficient leading.
5. A reasonable length of line.
6. Black ink.
7. White or nearly white paper, hard, opaque, without gloss.

It would seem invidious for the writer of this review to criticise points of the report, for he was a member of the committee. But it is common knowledge that no one sees mistakes in work so well as after it is done and temporarily forgotten. So it is in this case, the lapse of two or three months between the completion and the sight of the printed report allowed it to be seen with new eyes, and in the beauties of the report flaws were seen.

For one thing, we casually mentioned that a good margin is necessary, but failed to indicate what is "good." I would here suggest for consideration a formula that has occurred to me recently. The sum of the widths of the margin should not be less than half the width of the line, and of this width one-third should be the margin against the binding.

We completely forgot to say anything about that most necessary part of the book—the binding. When I came to examine a large number of school books the omission seemed flagrant. For I found numbers of books with excellent paper and type that could not be used, just because they were wrongly bound. It is common practice to "bind"

small books by clipping them through from side to side with wire staples, with the result that they cannot be opened flat. In fact, books so bound will not lie open without the restraint of at least one hand, often of both hands. It is obvious such books are unreadable, the binding margin is lost, and sometimes even the print against the binding. Also the books are soon destroyed from excessive handling.

We were a little weak in our recommendations for leading, i.e., for the spacing between the lines of letters. Our recommendations were insufficient for the age groups under 8 years of age. It would have been better if we had adopted some simple and easily remembered formula, such as:—The minimum interlinear space between the lines made by the short letters should not be less than twice the height of the short letters.

Again, I am inclined to think we should have done better if we had attempted to come to some decision between the merits of rival styles—"old face" and "modern face." Experience subsequent to the meeting of the committee has led me to be a whole-hogger in favour of the "old-style antique," of which specimens are given in the report. It seems to me that there is no question of its superior legibility, and of the general sense of pleasure that a well-set-up page of this style of type gives. The page is not only more pleasant to look upon, but it has an air of distinction that is a dignified introduction to what we may hope are pearls of wisdom in the text.

The whole point can be well seen in the specimens of type given in the appendix. Some of these are not samples of what is permissible, but rather of what should be eschewed!

No. 3 is by far the most satisfactory specimen for its age group. It is actually smaller than No. 1, yet it is legible at a slightly greater distance. No. 4 is an example of this same excellent style of type, but the specimen is totally spoiled by the insufficiency of the leading. No. 5 is an example of type that does not look out of the way when printed upon the rather soft paper used for the report, but which is found to be fatiguing and disturbing to the eye when the same type is printed upon a good hard paper with full bodied ink. Then there is a most unpleasant effect which might be likened to the dazzling produced by viewing a long row of palisading. The hair lines are too fine in comparison with the downstrokes, that is a common fault with the "modern face" style. No. 6 shows an excellent sized type according to measurement, and the leading is perfect, but the whole effect is "pale faced," and this will be more marked when harder paper is used. No. 7 has insufficient leading. No. 8 shows irregularities in the leading or spacing of the words in the lines. The first line is too

widely spaced, the third is correct, the lower lines have insufficient spacing.

It may seem captious to point out these mistakes rather than to point out the excellent results that are likely to accrue from the work of the committee. These last will come most certainly, and they will be less delayed if we can speedily discover our errors. Those I have noted were only discovered to me when, during a discussion on school books, it was pointed out that a book that I had marked as unfitted for such usage, conformed in every way with our standards—indeed it was printed in one of the very same types that appeared in the specimens! The very excellence of the paper on which that book was printed made the "palisading" effect of the type unmistakable and wearisome to the eye.

Section 10 of the report reads as follows:—"Particular requirements of special subjects: Bibles, Prayer-books and Hymn-books.—It is to be regretted that these books are so frequently printed in type which is injurious on account of its small size. It is desirable that the standard given in the table should not be lowered with respect to these important books, which are frequently used under poor conditions as regards illumination." The statements of this paragraph are not one whit too strong—in fact, they do not reveal the full seriousness of the case. The true state of affairs, certainly as regards the Bible, is that there is not at this date one edition of such size and style of type that it can be safely used as a school text-book by children. The reason is a simple one. The Bible contains far too much matter to be capable of being squeezed into the size of volume that can be handled by children. The absurdity of the situation is manifest. Then why is it attempted? We do not do this foolish thing for Shakespeare; we recognise that the separate plays are the correct thing to issue to the children. And the Bible is no more necessarily supplied as a whole than is Shakespeare. Indeed much of the charm of its separate books is lost when we insist upon thrusting each and all into a uniform line. We want the issue of good separate parts, priced at such a level as will secure perfect paper and type. And also we want a children's Bible, with just those parts and books of the Bible that are used in schools both for devotional purposes and study. This was done for the soldiers of the redoubtable Cromwell, when the Bible was the one and only book of the nation. Why cannot it be done now, and for the children, to the greater gain of all?

The whole moral of the report of the committee of the British Association may be summed up in the words—less material and better quality.

N. BISHOP HARMAN.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856.

RECONSTRUCTED 1888.

INCORPORATED 1892.

AN Ordinary Meeting of the Society of Medical Officers of Health was held at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, March 14, 1913, at 5 p.m. Present:—Prof. E. W. Hope, President (in the chair), Sir Shirley F. Murphy, Drs. C. Sanders, P. W. Spaul, Louis C. Parkes, F. E. Rock, J. D. McCrindle, S. C. Lawrence, C. Porter, H. A. Hall, Alex. Graham, F. C. Linton, H. R. Kenwood, John Tate, C. S. Brebner, A. Ball, Herbert Jones, C. Rolleston, J. W. Hembrough, E. F. W. Bywater, W. J. Butcher, R. H. Wilshaw, C. F. Stoving, J. W. Cook, J. S. Tew, W. Whitaker (Associate), and the following visitors:—C. S. Joseph, C. E. Allan, C. L. Goode.

MINUTES.—The minutes of the previous ordinary meeting, held on February 14th, 1913, and published in PUBLIC HEALTH, March, 1913, were taken as read, approved and duly signed by the Chairman.

ELECTION OF FELLOWS.—The following candidates, who had been duly nominated, were balloted for, and were declared by the President unanimously elected:—

S. J. Clegg, M.B., B.Ch., D.P.H., City Hospital, Walker-gate, Newcastle-on-Tyne; Ronald T. Herdman, M.D., C.M., D.P.H., 13, Merton Road, Bedford; James B. Howell, M.R.C.S., L.R.C.P., D.P.H., Public Health Department, Whitehorse Street, Stepney, E.; Percy Wheeler Kent, M.R.C.S., L.R.C.P., D.P.H., Springbank, Barry, Glam.; Hugh Lawrie, M.B., C.M., D.P.H., Lodge View, Ramsbottom, Lancs.; A. F. Bernard Shaw, M.B., B.Ch., D.P.H., City Hall, Cardiff (Assist.).

NOMINATIONS.—The Hon. Secretary read a list of nominations for election to the Fellowship of the Society.

PRESENTATION OF PORTRAIT.—DR. J. D. MCCRINDLE, President of the Midland Branch, said he had a very pleasing duty to perform in asking the Association, on behalf of the Midland Branch, to accept a portrait of their late President, Professor A. Bostock Hill. It did not need many words of his to commend Dr. Bostock Hill to the Society, as he was probably better known to one and all present than to him, although he had known him for ten years, and had been associated with him most of that time in the Midland Branch. They were all proud of the Professor, and he was quite certain that his portrait would very appropriately fill a vacant space on these walls.

The portrait was then unveiled, and formally presented amid applause.

The PRESIDENT said that there would be but one feeling—that of gratification in accepting this addition to their gallery of portraits—an addition

which, as Dr. McCrindle has said, was a worthy and deserving one. The portrait itself was a remarkably good one, and, if he might be permitted to say so without any suggestion of flattery, was a very admirable presentation of their late President, and they would all see it on their walls with a great deal of satisfaction.

* Dr. LOUIS PARKES then read a paper on "Block Dwellings for the Working Classes," and the following took part in the subsequent discussion:—Professor E. W. Hope (President), Mr. C. S. Joseph, Sir Shirley Murphy, Dr. Herbert Jones, Professor Kenwood, and Dr. C. Porter.

Home Counties Branch.—The sixth meeting of the session, 1912-13, was held at the Society's Rooms, 1 Upper Montague Street, Russell Square, W.C., on Wednesday, 19th March, 1913. Present: Dr. Beale Collins, in the chair, Drs. Lawrence, Laird, Dupont, Robinson, G. C. Taylor, Tate, Ball, Brebner, Rock, Stevens, Clark, Stovin, A. E. Porter, Brind, Fremantle, Stevenson, Kirkhope, D. J. Thomas, Barnett, Prior, Arnold, Scorisbrick, and George F. Buchan, Hon. Sec. Apologies for absence were intimated from Drs. Howarth and Seaton.

Dr. T. H. C. STEVENSON read a paper on "Mortality in Town and Country." The discussion which followed included the subject of the paper, "The Manual of Causes of Death and the System in Vogue of Transferring Deaths," and was taken part in by the Chairman, Drs. Fremantle, Rock, A. E. Porter, Lawrence, Buchan and Barnett. Dr. Stevenson replied.

North-Western Branch.—A meeting of the Branch was held at the Grosvenor Hotel, Manchester, on Friday, February 21st, 1913. Present: Dr. R. Sydney Marsden (in the chair), Drs. Corbin, Paddock, Peck, McClure, Greenwood, Daley, Buchan, Gibson, McMaster, Vacher, Webb, Chadwick, Talent, Holmes, Melville, Dearden and Barlow (Hon. Sec.). Apologies for inability to be present were submitted on behalf of the President (Dr. Meredith Young). Congratulations were offered to Dr. Greenwood on his appointment to the medical officership of the county of Kent, and Dr. Greenwood thanked the members of the Branch for the kindly sentiments expressed towards him.

Papers: Dr. McMaster read his paper on "Meat Poisoning and its Administrative Control," which was followed by a paper by Dr. St. Clair McClure on "An Outbreak of Food Infection in Manchester." A very full discussion took place on the papers, in which Drs. Peck, Corbin, Buchan, Talent, Daley, Marsden and Barlow took part, and a vote of thanks was conveyed to the readers at the close. At the end of the discussion the following resolution was passed,

* To be published in a subsequent number of PUBLIC HEALTH.

namely:—"That this Branch is of opinion that all places where meat foods for human consumption are cooked or otherwise prepared should be compulsorily registered; that the Local Government Board be requested to issue regulations for the control of such places (on the lines of those issued with respect to bakehouses); and that the local authority should have power to refuse registration if such regulations be not complied with."

The Branch is also of opinion that the inspection of meat in both urban and rural districts should be placed upon a uniform and scientific basis.

Resolved: That these resolutions be sent to the Council.

Southern Branch.—A meeting of the Branch was held at the Town Hall, Portsmouth, on Friday, March 7th, 1913, at 2.30 p.m. Present:—Dr. Gibson (President), Drs. Hugh Stott, J. P. Walker, A. G. R. Cameron, James Fairley, R. H. Wilshaw, and A. Mearns Fraser (Hon. Sec.).

The minutes of the last meeting were read and confirmed. Letters of apology for absence were read from Drs. Livingstone, Goodwin, Willoughby, Lyster and Hutt.

It was decided to postpone the resolution dealing with the resignation of members of the Southern Branch from the British Medical Association until the next meeting.

It was proposed by Dr. Cameron, seconded by Dr. Wilshaw, and resolved that the deputation appointed by the Parent Society to interview representatives of the British Medical Association be reminded that no satisfactory conclusion has been arrived at in regard to the action of the Brighton Division of the British Medical Association against Dr. Duncan Forbes; that the present position is that the Brighton Division, in order to secure the expulsion of Dr. Forbes from the British Medical Association, have refused to accept Dr. Forbes' resignation, and have not yet altered that decision. The Southern Branch suggest, therefore, that the deputation from the Parent Society should keep this matter prominently before them in their interview with the British Medical Association with a view to securing a solution satisfactory to Dr. Forbes and to members of the Southern Branch.

Dr. Hugh Stott then gave a most interesting account of the recent outbreak of small-pox in West Sussex. This was followed by a discussion, and a hearty vote of thanks was accorded to Dr. Stott.

It was decided that the arrangements for the next meeting be left to the President and Hon. Secretary.

Yorkshire Branch.—A meeting of the Branch was held at the Education Offices, Leeds, on Friday, the 28th February, 1913. There were present:—Dr. Anderson (Wortley) in the chair,

Drs. Atkinson (Settle), Burman (Wath), Cameron (Leeds), Gibson (Wakefield), Jefferson (Ripon), Mair (Harrogate), Martin (Brighouse), Mason (Northallerton), Pickles (Malton), Pearce (Batley), Sutherland (Cleckheaton), Wilson (Beverley), and J. R. Kaye, Hon. Sec. (Wakefield).

At the Council Meeting the invitation of Doncaster to hold the next meeting of the Branch in that town (during the Health Week in April) was unanimously accepted, and the Secretary was instructed to thank Dr. Anderson for his kind invitation for the 9th April.

It was resolved that the annual dinner, under the circumstances, should not be held this year, but that a tea should be substituted when at Doncaster.

It was also resolved to suggest to the Central Society that tuberculosis officers be admitted as members of the Society.

At the Ordinary Meeting the above recommendations of the Council were adopted.

An interesting discussion then took place, by special request, on the address of the President, which appeared in the February number of *Public Health*.

Other items, such as the appointment and duties of Health Visitors, the Milk and Dairies Bill, and the Public Health (Tuberculosis) Regulations, came under consideration.

Midland Branch.—The last meeting of this Branch was held at the Council House, Birmingham, at 3.30 p.m., on Thursday, March 6th, 1913. Present: Dr. J. Doig McCrindle (in the chair), Drs. H. Gibbons Ward, C. E. Tangye, T. Ridley Bailey, Ernest Hill, Mabyn Read, George A. Auden, H. R. R. Fowler, T. W. Beazeley, Jean R. Shaw, A. M. Cargin, T. G. Shand, T. Shadick Higgins, A. Bostock Hill, Herbert Manley, J. M. Cowie, Army Ashkeny, A. Hamilton Wood, and E. H. Snell. Apologies for absence were received from Drs. Henry May, J. Robertson, J. W. Miller, Dryburgh Gold and Petgrave Johnson.

Dr. A. HAMILTON WOOD read a paper on "The School Medical Officer and School Attendance." A discussion followed; this was joined in by the President, Drs. Manley, Auden and Bostock Hill, and Dr. Hamilton Wood briefly replied.

Northern Branch.—A special meeting of the Northern Branch of the Society of Medical Officers of Health was held at the office of Dr. Kerr, Town Hall, Newcastle-on-Tyne. Dr. Mostyn, Darlington, presided over a good attendance.

Dr. RENNEY, Sunderland, opened a discussion on the Tuberculosis Order of 1912. After having briefly outlined the provisions of the Order, Dr. Renney said he hoped notifications would come in better under these regulations than they had done under previous ones. They had not had three

times as many notifications as they had had deaths. Perhaps when local authorities began to do something in the way of prevention and treatment there might be more cases notified. The regulations as a whole would probably prove an unwelcome burden to medical officers of rural districts, as they would have a great deal of extra travelling, for which they would receive no pay. Unless financial assistance was forthcoming from the Government he was afraid things would go on very much as they were now.

The CHAIRMAN said the amount of work would no doubt be very serious; they could not calculate it. At present it would be best to go on with the work, and when they had some idea of it, it would be best to ask for some modification. A question that had been troubling some people recently was the extraordinary thing that the pulmonary cases amongst school children had been growing less every year according to the returns. It was suggested this might be due to school medical inspection, attracting the attention of parents, so that they do not now send to school those who were sent two years ago. Notifications ought to clear that matter up for them. The difficulty about getting addresses was a very real one. Of persons who died in workhouses outside his district, and whose certificates of death were then handed on to him, it was exceptional to have a full address. He thought they might ask the Registrar-General to urge upon District Registrars to try to get the person who notified a death to give as full an address as possible whenever a death did not belong to the place where it was registered. For example, he got the address of somebody, "Darlington." It was impossible to find out where the person lived. He might have been a tramp, and Darlington the last town he passed through before reaching the workhouse where he died. He found it was less thorough for the medical officer's staff to make out accounts for notifications, rather than to leave them to be sent in by the individual doctors. He had paid accounts six and seven years old.

Dr. STAINTHORPE, Saltburn, asked for information with regard to contacts. When a medical officer of health visited a house he might find a number of contacts out, and he might have to try a number of visits. Could he charge for more than postage? He had travelled 12 miles to see a case, and 15 to see a second, but got no compensation. With regard to the removal of patients from point to point, the Order should have had an arrangement whereby a patient should inform the medical officer of health with regard to the removal from one district to another. As it is, many patients escape. Of late there had been a tendency on the part of governing authorities to make the people believe that whatever disease they suffered from was due to

something outside of themselves. It needed to be impressed upon people that personal environment had as much to do with their health as impersonal environment.

DR. T. E. HILL, Durham County, said they knew perfectly well the medical officer of health could not visit every contact. If, however, the Local Government Board Memoranda with regard to tuberculosis was read, it would be seen that a very strong recommendation was made that the officers to be appointed by the County Council for the purpose of carrying out the tuberculosis scheme should be available for duty under the local medical officers of health, and in his opinion that would be an absolutely practical method of dealing with the question. In Durham they were appointing five whole-time assistants as well as the full-time officer, and it appeared to him that for them to act under the local medical officers of health was one way out of the difficulty. They would also have nurses whose services would be available for visiting. When following up school cases they could make friendly inquiries without being inquisitorial, and if they found other members of the family not well, they could be requested to attend the tuberculosis dispensary. His own County Council was already committed to a scheme to appoint 41 health visitors or nurses. The population was nearly 970,000, so that there would be a nurse to every 25,000 persons. They would be appointed for the treble purpose of the Registration of Births Act, following up school cases, and tuberculosis. Dr. Hembrough, Northumberland, said he thought there would be friction with the local practitioners if the tuberculosis officers went to examine contacts. He proposed to keep a supply of tuberculin at the Shire Hall until they got the dispensaries established to issue to the districts if the officers were sufficiently experienced to use it.

DR. KERR said in Newcastle their whole experience had gone to show the absolute unselfishness of the doctors. In not one case had domiciliary treatment been recommended so that more fees could be obtained.

MR. A. SMITH, Whickham, said his experience had been similar. The practitioners had not notified any cases until they were quite certain. It had struck him that the question on non-pulmonary tuberculosis was of great importance. The great majority of these cases occurred amongst the young, and were diseases of the bones. Probably 60 or 70 per cent. of these cases were bovine in origin. If the notification of these cases was to be followed up and by a proper investigation, that proper investigation must go to the dairies and cow-sheds. If they were going to abolish the tuberculosis of children they must first deal with the dairies and cow-sheds.

DR. STAINTHORPE asked if the health visitors would be under the local medical officers of health.

DR. HILL said they would be practically officers of the medical officers of health. In the county they had at that moment four. He saw their diaries once a month, but they received all their orders from the medical officers of health, though they were appointed and paid by the county.

DR. STAINTHORPE thought that in the North Riding of Yorkshire they had a wide area, and its organisation would be a difficult matter.

DR. HILL said he did not think so.

COMPLIMENTARY DINNER TO DR. H. E. ARMSTRONG.—On Friday night, January 24th, the members of the Northern Branch of the Society of Medical Officers of Health entertained Dr. Henry Edward Armstrong to a complimentary dinner at the Central Station Hotel, Newcastle, on the occasion of his retirement from the position of medical officer of health for the city of Newcastle-on-Tyne. Dr. Mostyn, medical officer of health for Darlington, presided, and there was a good attendance.

The CHAIRMAN gave the toast "Our Guest." He said Dr. Armstrong was the founder of their branch; it owed its existence to him. Many present owed their training in public health to him. He had never forgotten the time when he first interviewed Dr. Armstrong in the town hall. Just by accident, he happened to be staying in the district on a holiday, when he saw Dr. Armstrong advertising for a resident in his fever hospital, and he was very glad indeed to have been chosen for the work. He owed to Dr. Armstrong a very great deal indeed; and he would like to tender his very sincere thanks to the doctor's very able lieutenant, Miss Ogston. From that lady he learned a great many important things about men, women, and hospital management, upon all of which she had views. He had seen Greek meet Greek, when Dr. Armstrong and his matron had little differences of opinion. He was sorry Miss Ogston was not there that night. At Walker Gate Dr. Armstrong certainly showed him how he thought things ought to go in public health work. Of course, Dr. Armstrong was one of the pioneers, and began at the beginning of public health. He had had the advantages and disadvantages of making public health what it is. He was a man of many parts, a poet and a musician, and he knew not how many more things besides. Now that he had retired he had time to do some work for the good of public health at large. They should have his criticism for the way things are done. He thought Dr. Armstrong should tell them something about his mistakes. They all had to learn. It was often by their own mistakes they did so, and he personally would rather learn by someone else's. They were going to insist upon his re-

remaining the senior member of their Society, and they would look upon him as something above the House of Lords. He would like Dr. Armstrong to take hold of some of the important public health questions with which they had to deal, and teach his younger brethren in the profession how to go. They were now arriving at a second stage. They were having to get an acknowledgment of their status as public health officials. The people who were opposing them were almost all people with axes to grind. They had the highest authority in the country recognising their work, and if they sat tight, and did their work well, they would consolidate their powers. Dr. Armstrong had been able to do a great deal which they, as smaller people could not do. He would not have dared to treat the butchers as they had been treated in Newcastle, but Dr. Armstrong had made friends of them, and he (the speaker), was looking forward to the time when there would be built in Newcastle a really decent slaughter house, built by the butchers, as a memorial to Dr. Armstrong. (Laughter.) He did not envy the man who had got into Dr. Armstrong's place, though no doubt Dr. Kerr would do his best. (Applause.)

DR. RENNEY, the Vice-President, said he had great pleasure in seconding the toast. He had known Dr. Armstrong from his student days. He had learned a very great deal of surgery from him, and as a student in public health he sat at the feet of their guest that evening and learned words of wisdom. Dr. Armstrong was one of the pioneers of public health, and it would be most interesting if they could have the results of his life-work put into pamphlet form. The strides public health had made during the last thirty or forty years were immense, and Dr. Armstrong could tell them things that would be exceedingly interesting. As a friend or colleague it would be impossible to find a finer man. In cases of difficulties of his (the speaker's own) he had gone to Dr. Armstrong, and he had never gone without being assisted in the most friendly and kindly spirit. (Applause.)

The toast was drunk with enthusiasm, and the acclamation was renewed when the guest rose to reply.

DR. ARMSTRONG, after thanking the mover and seconder for their remarks, said he felt very much the position in which he was now placed with regard to his colleagues in the sanitary world. He felt now that he was practically out of it. (No, no.) Yes, he was practically out of it, they had better take things as they were. It was no use looking at things in a false light. He did not intend, he could not go on as he had done hitherto, it would be simply a farce, and half measures were never satisfactory. He did not intend even to write. Having referred to his appointment of Dr. Mostyn as his resident at the

fever hospital, and of Dr. Kerr as his assistant medical officer of health, he said he was proud of the appointments from the way they had turned out. They were amongst the best he had ever made. Dr. Mostyn was good enough to say he was the founder of that branch of their association. He was not quite sure of that, but he would say that Dr. Yeld, one of Dr. Renney's predecessors and himself were the starters and founders of an association called the Northern Counties Association of Medical Officers of Health, before there was any branch of their present association. He had the minutes of that old association. He could not help also alluding to another personage mentioned, his colleague, the matron of the fever hospital, Miss Ogston. A better woman nobody could wish to work with. She was with him 27 years, and she resigned of her own accord, because she found she was not able to get about her work as she had been doing. From the first there was never a tug of war, in spite of Dr. Mostyn, he denied the soft impeachments. They did not always see a thing in the same light, but he did not know that he ever refused to accept a suggestion from Miss Ogston. Dr. Mostyn made an allusion which he could not help thinking was a little sarcastic. He suggested that he (the speaker) had now arrived at a stage when he might find time for work. He did not intend to do any sanitary work. It would be folly for him to give up an appointment for which he received a salary, such as it was—(laughter)—to do work without a salary, such as it was. (Laughter.) He did not think he would like to show up his mistakes. He was not going to show up his mistakes without being paid for it. (Laughter.) If Dr. Mostyn wanted him to do this he would have to pay a handsome salary. Allusion had been made to his early career, when things were very different to what they now are. He had a great many hard struggles, though not with his committee. He did have a row with the Tyne Port Sanitary Authority, and left them, but he never had any trouble with his own committee. He did have trouble, however, with a late official, who was perhaps the cleverest man he had ever met in his life, but he was altogether against sanitary measures. There were occasions when in dealing with that gentleman he had to take his courage in both hands. It might interest them to know he was not the only Dr. Henry Edward Armstrong, a medical officer of health. There was a gentleman of that name in the United States, who had called to see him; while there was also a Dr. Henry Edward Armstrong in London, a member of the Imperial Institute, and a scientist for some of whose work he (the speaker) had received credit. (Laughter.) He thanked them for their gorgeous hospitality, and for the way in which they had drunk his health.

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TUBERCULOSIS.

TUBERCULOSIS in one form or another still overshadows all other sanitary problems; and schemes for diagnosis and treatment are being matured or are passing from a provisional to a permanent phase. The working alliance of the medical officer of health and the clinical specialist should be ideal, but, medicine being one and indivisible, there exists some danger of over-specialization, slight in the earlier stages, when the officers are fresh from an experience in all branches, but ever increasing as their attention is limited to one particular type of morbid manifestations. Even in this narrower field it will be difficult to find a sufficiency of men able to give a first-rate opinion on all the clinical, bacteriological, radiographic and therapeutic issues involved. Any scheme may ultimately be imperilled which does not provide for the special reference of cases of difficulty and still more if it does not expose its officers to the chastening influences of the post-mortem room.

Some recent reports have thrown doubt on the value of sanatorium treatment, and in this connection the paper of Dr. Major Greenwood is of interest as showing the need for special caution in assessing the evidence, while it is reassuring to find he can conclude his fellow-statisticians have, in the main, only proven the axiom that the expectation of life of persons suffering from tuberculosis is less than that of those not so suffering and that it varies inversely with the extent of their disease.

For practitioners of one school of thought tuberculin is well-nigh all in all, for others it is anathema, its employment and indications rest largely on an empirical basis. Dr. Macalister shews, from the bacteriological standpoint, how complex are the phenomena to be controlled, very many varieties of bacterial by-products have been used to produce immunity and their effects may be expected to show wide divergencies of type. Dr. West concludes that tuberculin is too fine a test for routine diagnosis in that it does not draw a distinction between a recent and a healed lesion. Unless there is a focal reaction it throws no light on the site; while such a reaction is not entirely devoid of risk. The cutaneous reaction is positive in some 90

per cent. of normal healthy adults, and, since it is inconceivable that this number should either receive or need treatment, it is undesirable to run the risk of frightening the patient and perhaps of substituting a definite neurosis for an uncertain tuberculous affection.

Dealing with the therapeutic use of tuberculin Dr. Wall sounds a note of warning. Many do well under this method, but if given at unpropitious times or in unsuitable doses, the administration of tuberculin may be followed by disaster. There is the further difficulty in assessing the value of this treatment in that the cases which are most suited to it are generally found to respond immediately to any favourable change in their environment.

Possible dangers to some schemes may arise from under-estimating the labour involved in the investigation of each individual. Dr. Lauder relates that every patient at the Southampton dispensary is seen three or four times on successive days for preliminary diagnosis and prognosis, forty-five minutes being allowed for the first visit. Each case is investigated in every possible way. If the complete enquiries he postulates form the necessary standard the staff of tuberculosis officers needed for the country will be considerable indeed, particularly if, as is recommended, all doubtful cases are reviewed after the lapse of some months.

Dr. Shrubsall draws attention to the variety of types for which sanatorium provision will be necessary; in relation to residential treatment it may be well to consider whether the demand for homes for advanced cases may not tax to the uttermost the facilities at present available and whether such provision is not more urgent than that of sanatoria for cases of an intermediate type, who could be treated at home after a short educational course. When the advanced consumptive is not a direct danger as a distributor of bacilli he is often a secondary danger by wearing down the resistance of those relatives who undertake the responsibility of nursing him in his final stages of illness.

Lastly the psychological aspect of the problem should not be forgotten, the proverbial *spes phthisica* appears to have assumed an epidemic phase, yet a general attitude of cheerful optimism is likely at least to benefit the patient if not the body politic.

TUBERCULOSIS AND THE TUBERCULINS IN THEIR RELATION TO IMMUNITY.

By G. H. K. MACALISTER, M.D.

INTRODUCTION.

BEYOND certain obscurantist adumbrations in the writings of Robert Fludd, a sixteenth century rosicrucian, who argued that injections of sputum might be of service in the treatment of pulmonary disease, there is no record of any attempts at active immunisation in tuberculosis before the days of Koch. It is, however, interesting to note that the early methods of Fludd, based upon chaotic reasoning of a cosmic type have within recent years found an echo in the work of Wittgenstein and Passini, who reported favourable results in patients injected with filtered sputum.

The problem is more difficult and complicated than any other in the fields of bacteriology and immuno-chemistry. More ink has been spilt upon it, fiercer controversies have raged round it, than round any other single subject within the same period. And we are not yet in possession of a satisfactory comprehensive theory, which will explain observed phenomena, resist criticism and experimental fallacy, and provide a logical basis for a system of treatment.

The starting point for a consideration of the subject must arise from Koch's discovery and his pioneer work upon the superinfection of tuberculous guinea-pigs. These investigations are set out in detail in every elementary text book. The introduction of his first tuberculin preparation was suggested by the observations that inoculations of bacillary bodies alone caused abscess formation. From this he reasoned that the substance, which in suitable doses conferred immunity, and in larger doses caused reactions or death, was contained in broth extracts of the bacillus and that the necrosis-producing substances adhered to the bacillary bodies.

The peculiar difficulties of the question are intimately associated with the physical and chemical characteristics of the infecting organism and the nature of the pathological changes excited by its invasion. In the present paper, therefore, these two matters will first be considered. Then the nature of the various tuberculins and allied preparations will be reviewed as concisely as possible, and the views of various authors upon their mode of action will be discussed.

Chemical Composition of Tubercle Bacillus.

The tubercle bacillus is composed of fatty substances, proteins, carbohydrates, salts and water. The skeletal envelope is composed of cellulose and possibly chitin. The fats and proteins alone require detailed consideration.

The amount of fatty substance present varies according to the age of the culture from 8 per cent. to 25 or 30 per cent. The nature of these substances has been investigated by many workers, who, using different extracting agents, have arrived at varying conclusions. Their work shows, however, that there are present a number of fatty acids, some ill-defined lipid substances and an alcohol of high molecular weight, regarded by some as a wax. The acid-fast property, upon which the characteristic staining reactions depend, resides in this last substance.

The study of the proteins contained in the organism is rendered difficult by the presence of fatty substances, which resist the access of suitable chemical reagents. A number of different bodies have been separated, principally nucleo-proteins and toxomucins. No toxalbumins analogous to those formed by other pathogenic bacteria can be recognised in bacillary extracts.

A number of workers have attempted to isolate the essential toxic substance for the proteins of the tubercle bacillus. Rappel obtained from crushed bacilli, a nucleic acid, which he called tuberculinic acid, and tuberculosamine, one of the protamine group. From tuberculinic acid, tuberculothymic acid and tuberculosine, a crystalline substance, were obtained. Tuberculosine was considered by v. Behring to be the specific poison. It is thirty times, while tuberculinic acid is four times as toxic as Koch's old tuberculin.

Antibodies to Various Constituents of the Bacillus.

Much and his co-workers have done work of great importance in studying the relation of the various components of the bacillus to immunisation. Separated by suitable means it was found that the proteins, neutral fats and lipoids, individually had separate antigenic properties, that is to say, that each component had the power of evoking a specific antibody. Further, by shaking triturated bacilli suspended in a weak solution of an organic acid (e.g., 1 p.c. lactic acid), for a few weeks in a shaking machine at 58°C, a fine emulsion was obtained which contained the various components, free and in active condition, unmasked as it were. Filtration yielded a clear fluid, which was found

upon chemical analysis to contain traces of polypeptides. So that, by appropriate chemical means, it was found possible to split the tubercle bacillus into its four constituent parts, protein, neutral fats, lipoids and the filtrate containing polypeptides. Injected into tuberculous guinea-pigs, it was found that of the four the filtrate alone had the power of causing death, accompanied by typical fever, general reaction and characteristic post-mortem appearances. The filtrate was found unsuitable for therapeutic use, owing to its high toxicity. These researches require further study and confirmation, but are highly suggestive as indicating a means for isolating the specific poisonous element in the bacillus.

A study of the pathology of tubercular disease shows that the action of the bacillus in producing characteristic lesions is partly toxic and partly mechanical. An entering bacillus coming to rest within the tissues may at first start local necrosis and the minute necrotic areas will be the point of origin of a typical tubercle. These initial stages have been accurately studied by Warthin in cases of tuberculosis of the placenta. In other cases the entering bacillus is taken up by a leucocyte and transported in the blood-vascular or lymphatic system to a remote part, there to initiate tuberculous disease.

The inoculation of certain neutral fats, agar, cholesterin, insoluble salts and other bodies has been shown to be capable of inducing proliferation and giant-cell formation and to give rise to typical tubercles. Non-pathogenic acid-fast bacilli inoculated together with neutral fat have been shown to cause lesions resembling those of tuberculosis. These organisms rendered pathogenic by exaltation of their toxicity give rise to similar manifestations. It appears, therefore, that if the preliminary necrotic changes can be artificially induced, the tubercle formation depends upon partly mechanical processes due to the presence of large quantities of insoluble matter. If the organism contains specific toxic substances, or substances capable of producing a specific poison, the general toxic symptoms associated with tuberculosis will follow. If the organism is non-toxic the disease will not progress owing to the absence of such manifestations.

Therapeutic Principles.

The active immunisation against tuberculosis depends upon the treatment of infected persons with bacillary products containing toxic substances unmasked and freed from insoluble materials, so as to stimulate the body to

protect itself against further effusions of poisonous material.

The total number of varieties of tubercle bacillary products that have been recommended for the purpose of producing active immunisation amounts roughly to one hundred. A large number of these have not been deemed worthy of extensive trial, but have been placed rather in the category of historical curiosities. Others rest upon a restricted measure of clinical support; the evidence in favour of their efficacy is of a type difficult correctly to appreciate. Of the whole number less than ten have been used upon any extensive scale.

Classification of Tuberculins.

Tuberculins and allied preparations fall roughly into three classes. The first includes culture fluid products; the second, preparations from the bacillary bodies; the third, preparations in which both culture fluid and bacillary bodies are employed. A small fourth group contains products which may be termed compound tuberculins, in which certain added drugs appear. These have no great practical importance.

Culture Filtrates.

Of the ordinary culture fluid products the most important are Koch's Tuberculin-original and Denys's Bouillon Filtré. They contain only that portion of the specific bacterial substance which has diffused out into the broth during growth. That is to say, that, in addition to the original constituents of the culture fluid, they contain metabolic, and, possibly to a small extent, autolytic products of bacterial activity.

One member of this class has an important theoretical bearing; it has, moreover, during recent years been extensively studied from the clinical side. Koch's albumose-free tuberculin is derived from the cultivation of the organism upon a synthetic medium in which the only source of nitrogen is asparagin, an amino-acid.

Analyses of albumose-free tuberculin have been performed by Lockemann and by Löwenstein and Pick. The culture media employed for the two sets of investigations showed slight differences. From their results, the authors conclude that a polypeptide is present, and no true protein.

Vaccines.

The group of substances for the preparation of which the bacterial bodies alone are used may be divided roughly into two sub-groups, the true vaccines and the bacillary extracts. The most familiar member of the vaccine

group is the bacillary emulsion of Koch, which consists of organisms ground up in a mill until no formed elements are recognisable. No heat is used for Koch's preparation; but Wright recommends that in the process of manufacture a temperature of 60° C. for an hour should be employed.

Somewhat different are the living vaccines. Living human strains, unaltered or attenuated by prolonged artificial cultivation or by passage through a cold-blooded animal, such as a salamander, have been employed for the prophylactic inoculation of bovines. The observation that the organisms may be recovered living from the tissues and secretions, notably the milk, of animals so treated, at a period of one or two years after inoculation, carries condemnation of this practice. Living vaccines of human or bovine origin attenuated by cold-blooded passage, vaccines prepared from the cold-blooded tubercle strains and from non-pathogenic acid-fast bacilli have been advocated by a number of workers. No satisfactory evidence in support of their efficacy has been adduced. Friedmann's procedure involving the use of a human tubercle bacillus passed through a turtle is attracting attention at the present time.

Bacillary Extracts.

Extraction of the bacilli by means of chemical agents has provided a number of students with a special field of study. The aim of work of this type has been to unmask the active constituents and to remove inert substances. Amongst other re-agents, ether, xylol, chloroform, chloral hydrate, sulphuric acid, sodium oleate, alkalies and water have been tried. A Russian preparation, Endotin, introduced by Gabrilowitsch, is obtained by treating bacilli successively with chloroform, alcohol, xylol, ether and weak alkali. It has been stated, however, that drastic treatment of this type destroys the active constituents of the bacillus.

Culture Fluid and Bacillary Substance Preparations.

prepa- that third group comprises tuberculins con-
caused. derivatives both of the culture fluid
that th bacillary bodies. Koch's tuberculin,
conferre member of this class consists of a
reactions roth tubercle culture concentrated
extracts under diminished pressure to one
producing original volume and filtered. It
bodies. more extensively than any of

The peculations. By means of precipita-
intimately as concentrated salt solutions,
chemical chart in purified form, that is to
ism and the nat-cific substances.
ited by its in

Two other tuberculins are those of Beraneck and Landmann. As there is a considerable amount of controversy between the advocates of these two types of preparation, it is illuminating to consider them in juxtaposition. Beraneck used as a culture fluid a glycerine broth medium containing no albumoses. To the concentrated fluid after six weeks' growth, he added equal parts of a one per cent. ortho-phosphoric extract of the bacillary bodies. This preparation is enthusiastically advocated by Sahli and has also been extensively adopted in this country.

Landmann uses a strain of bacillus whose virulence has been exalted by animal passage. After growth upon glycerine broth, the bacterial bodies are collected upon a filter, freed from fat, and extracted fractionally with distilled water, saline and dilute glycerine at different temperatures. That is to say, extraction is first carried out at 40° C. The solid matter from this is again extracted at 50° C., at 60°, and so on to 100° C. The products of these various extractions are mixed and added to the filtered concentrated broth fluid to form Landmann's tuberkulol. The extractions from the bacilli and the concentrated filtrate are also supplied separately.

Tested by the German official method of standardisation, which involves the determination of the dose necessary to kill a tuberculous guinea-pig in a fixed time, Landmann's preparation is very much more powerful than that of Beraneck. The high potency of tuberkulol is shown also by the fact that it is toxic for healthy guinea-pigs, and the specificity of this poisonous property is demonstrated by the fact that such toxicity may be neutralised by anti-tuberculous serum. Beraneck considers that such toxic properties are undesirable and that they bear no relation to the immunising powers of the preparation. The support of his tuberculin rests at present upon hypothetical considerations and scattered clinical observations. It may be true that toxicity and immunising powers are properties resident in separable fractions of the organism, but there is in the case of tuberculosis no direct proof of this, and we have at the present time no direct method beyond the toxicity test upon infected guinea-pigs for determining the strength of any given preparation.

Such, then, are the tuberculins. A consideration of the whole heterogeneous collection shows that the idea underlying their production has been the liberation of the specific substance

or substances in such a form that they may, by their activity, be capable of producing immunity. The sceptic argues from their very multiplicity that such preparations are uniformly worthless. On the other hand, it is claimed that, for efficient investigation of this problem, it is highly desirable for one batch of researchers to test the value of existing products and for another to concern themselves with the preparation of fresh types of reagent.

Hypotheses upon Immunity.

In order to get a clear conception of the mode of action of tuberculins, it is necessary to consider separately the diagnostic reactions and the immunising processes. It is not possible in a short article to consider the earlier views, as these are now of purely historic interest.

Tuberculin Reaction.

There are, broadly speaking, four different schools of thought, which afford different explanations of the tuberculin reaction. The schools of Koch, Wassermann and Ehrlich consider that the action is due to the working of a primary toxin. That this toxic antigen reacts with the antibody present in the focus of disease and with the floating antibody present in the circulation. The intermediate zone of a tuberculous lesion, where there is a derangement of cell metabolism, is rich in anti-tuberculin, and the introduction of fresh tuberculin induces a coalescence of antigen, antibody and complement with consequent cell destruction and liberation of toxic products. Citron and others are of opinion that tuberculous infection causes a multiplication of sensitive cell receptors at the focus of disease and throughout the body, and attribute the reaction to their excitation.

Wolff-Eissner also hypothecates an amboceptor action, but regards the reaction body as possessed of lytic properties. These lysins or bactericidal bodies possess the power not only of killing and disintegrating the bacteria to which they are antagonistic, but also of attacking and breaking up introduced tuberculin in a manner analogous to that in which albuminolytins decompose introduced albumin. The degradation products of tuberculin are the toxic bodies which produce the characteristic reaction. This hypothesis thus attributes the phenomenon to formation of a secondary toxin.

The same view, that degradation products of tuberculin are responsible for these effects, dominates the work of Friedberger and of Vaughan and their co-workers, who would homologate the reaction to a true anaphylactic

manifestation. Von Pirquet makes use of the term *allergia* and draws an analogy with the observations of v. Behring upon cellular hypersensitiveness in tetanus.

It has been suggested that the reaction is not specific but is a toxic effect, due to the albumoses contained in tuberculin. This may, however, be at once negated, as albumose free tuberculins are capable of producing reactions.

Tuberculin Treatment.

The curative and protective processes induced by a course of tuberculin treatment are considered by many workers to be due to focal changes, by which the focal cells are stimulated to throw off the infection and kill the organisms in that situation. This reaction may be reinforced and the protective mechanism completed by the formation of antitoxins or bacteriolysins. According to the view of Wright and Neufeld there are developed in the blood opsonins and bacteriotropins, which prepare the organisms for ingestion by the leucocytes and probably also by the large mononuclear endothelial cells. Whether opsonin is a simple body and comparable with bacteriotropin, or a compound body, and the opsonin found in heated serum identical with bacteriotropin are still debatable points. Laboratory methods founded upon Wright's observations afford means of estimating the degree of immunity present in any given case.

Those who regard tuberculin reactions as a manifestation of cellular hypersusceptibility or as a result of humoral activities consider that the aim of tuberculin treatment should be a development of such a degree of sensitiveness that could react and throw off entering or existing infection.

If there be serum sensitiveness, analogous to that accompanying anaphylaxis, such sensitiveness should be capable of passive transference to another animal. The bulk of evidence shows that this is not the case. Studying transfusion experiments on the largest possible scale, Faludi found that the newly-born children of a large number of tuberculous mothers failed to respond to tuberculin tests. Moreover, Landmann has shown that the phenomena associated with tuberculin reaction differ clinically and pathologically from anaphylactic manifestations in the widest possible manner.

On the other hand, by suitable treatment all the known types of antibody can be produced in a tuberculous animal, and the serum of such

an animal is said to be capable of conferring passive immunity if injected into another animal. Complement-binding antibodies are found in tuberculous patients, particularly in tuberculin treated cases. Michaelis and Eisner have shown that in advanced cases of phthisis which have not been treated with tuberculin, as well as in all tuberculin-treated cases, complement-binding antibodies to tuberculin may be demonstrated in the serum. In early cases, which have not received specific treatment, no such bodies are present.

Pickert and Löwenstein found in the sera of patients treated with tuberculin, a body, which they termed anticutine, which, incubated in vitro with tuberculin, was capable of depriving that substance of its power of provoking reactions. Anticutine was also demonstrated in cases which had not been treated, and from this circumstance, these authors conclude that the processes accompanying the natural development of immunity are similar to those artificially evoked by tuberculin administration. This point is of great importance, as the whole question of the value of tuberculin treatment depends upon the closeness of the relation between tuberculin immunity and immunity against tuberculosis.

The power of an animal to protect itself against tuberculin invasion and infection cannot apparently be said to depend upon its power to produce circulating antibodies, as early and mild cases have been observed to run a favourable course, although no such bodies could be demonstrated in the serum. It would appear that the cellular mechanism, multiplication of cell receptors and development of specific cellular activity must suffice in such instances to establish protection, without the development of floating receptors. In other words, that the immunity is of a strictly cellular rather than a cellulo-humoral type. This view establishes on a logical basis the work of those who consider that the object of tuberculin treatment is to establish an adequate degree of cell response in the infected host, rather than to neutralise the existing poison in the body fluids.

When the infection is so great that the direct cell-mechanism cannot cope with it, antibodies are poured into the serum and may be demonstrated by complement-binding methods. Moreover, such serum is capable of conferring a certain measure of passive immunity upon another animal. In advanced cases, such bodies may be present in great

quantities, and the failure of such persons to react to tuberculin has been attributed to a "choking" of the introduced tuberculin by an excess of floating antibodies.

The cellular immunity, as measured by cutaneous and conjunctival tests, varies little from day to day, whereas the amount of floating antibodies is a highly inconstant factor. The antibody content of the serum is a measure of the auxiliary protective mechanism. The serum of a man or animal, who has recovered from tuberculosis, in whom immunity has become well established, contains no demonstrable antibodies and conveys no passive immunity when injected into another animal.

APPOINTMENTS.

DR. F. R. B. ATKINSON has been appointed one of the tuberculosis officers for the County of Middlesex.

DR. W. AULD has been appointed medical officer of health to the Wimborne U.D.C.

DR. WM. A. BERRY has been appointed deputy medical officer of health, deputy medical superintendent of hospital and assistant school medical officer of the Borough of East Ham.

DR. H. C. H. BRACEY has been appointed assistant county medical officer of health for Warwickshire.

DR. J. S. BYRNE has been appointed assistant medical officer at the Bradford Tuberculosis Dispensary.

DR. JAMES CARRICK has been appointed assistant medical officer of health to the Paisley Town Council.

DR. HARRY COGHILL has been appointed one of the tuberculosis officers for the County of Middlesex.

DR. J. A. DAVIDSON has been appointed visiting medical officer of the Central London Schools.

DR. J. R. B. DONSON has been appointed one of the tuberculosis officers for the County of Middlesex.

DR. FOX has been appointed assistant school medical officer to the Kent Education Committee.

DR. E. J. GRIFFITHS has been appointed medical officer of health and school medical officer by the Pontypridd U.D.C.

DR. R. P. HEDDLE has been appointed medical officer for the County of Orkney under the scheme for the inspection of school children.

DR. J. COOTE HIBBERT has been appointed medical officer of health of Blackburn.

DR. JOHN LAMBIE has been appointed medical officer of health to the Mansfield Town Council.

DR. W. G. McARTHUR has been appointed medical officer of health to the Thirsk R.D.C.

DR. J. T. R. MacGILL has been appointed medical officer of health to the Littleborough U.D.C.

DR. D. G. M. MUNRO has been appointed one of the tuberculosis officers for the County of Middlesex.

DR. E. E. NORTON has been appointed one of the tuberculosis officers for the County of Middlesex.

DR. C. H. SEDGWICK has been appointed medical officer of health by the Daventry Town Council.

DR. P. J. TIMONEY has been appointed tuberculosis medical officer for the County of Fermanagh.

DR. A. W. VALENTINE has been appointed medical officer to the Barnstaple Port Sanitary Authority.

SUPERANNUATION.—The Society of Medical Officers of Health and the Council of the Royal Sanitary Institute is petitioning Parliament in favour of the Medical Officers of Health (Superannuation) Bill, which has been introduced by Sir Philip Magnus. The Council of the Institute decided to support the Bill, as they consider that it would tend to the better administration of the public health service if superannuation were provided for public health officers.

THE THERAPEUTIC USE OF TUBERCULIN.

By CECIL WALL, M.D., F.R.C.P.

Assistant Physician, Hospital for Consumption, Brompton.

TREATMENT in clinical medicine is very largely based upon hypotheses. If the hypotheses are sound the treatment is likely to be good, but unfortunately they are not infrequently built upon a somewhat insecure foundation. It behoves us, therefore, at frequent intervals to examine our hypotheses lest we should be led astray in an interpretation of our therapeutic results.

The discordant opinions with regard to the use of tuberculin in the treatment of tuberculosis seem largely due to the different hypotheses held with regard to the nature of the resistance of the body against the infection by the tubercle bacillus. The general principle of the treatment of tuberculosis by tuberculin is based upon the hypothesis which may be crudely stated as assuming that resistance against infection by the tubercle bacillus, and the establishment of cure after infection, are brought about by the development in the tissues and blood stream of certain specific anti-bodies: probable as this hypothesis appears, the evidence experimentally and clinically is by no means conclusive. The resistance against infection by the typhoid bacillus seems undoubtedly due to the presence of specific anti-bodies, but when we review our knowledge of the nature of the resistance against typhoid and tuberculous infections respectively, we are struck by the fact that the conditions determining susceptibility or immunity are of a different order. Experimentally, it is possible to immunize an animal against the typhoid bacillus; it does not seem as yet that it has been possible artificially to protect an animal against tuberculous infection.

Clinically, we expect typhoid fever in a person who has been infected by Eberth's bacillus, unless he has been made specifically resistant by previous infection. In tuberculosis, on the other hand, while we agree that the disease is not possible without the presence of the tubercle bacillus, we recognise as contributing causes, numerous other conditions, such as poor physique, overwork, worry, alcoholic excess, debilitating disease, and the like, which cannot influence directly the content of the specific anti-bodies in the individual. Moreover, if a person has had a tuberculous lesion in the body in the past and recovered, he seems to

remain more liable than a previously healthy person to a recrudescence of the disease or to a fresh infection in another part of the body.

If the resisting power against the tubercle bacillus can be proved to be due to the presence in the tissues of certain specific anti-bodies, it seems probable that before long an ideal antigen will be discovered, the introduction of which into the organism will lead to the formation of such anti-bodies, and so to the cure of the disease. It does not seem, however, that at the present time any of the tuberculins in use fulfil the requirements of an ideal antigen.

It has been fairly definitely established that the disease tuberculosis is partly due to the mechanical effect of the growth of the tubercle bacilli, and partly due to the biochemical effect of the toxins derived from the bacilli. The clinical study of tuberculous patients leads to the conclusion that many of the symptoms, such as fever, wasting, malaise, and the like, are, directly or indirectly, of toxic origin. In certain cases a power of resistance against this toxæmia develops, and this resistance is associated with the development in the blood of certain recognisable substances, such as opsonins, agglutinins, and complement fixing substances, which are not present in uninfected individuals.

The various tuberculins, when injected into the body of an infected person in suitable doses, produce symptoms very similar to those of tuberculosis, and by their administration similar new and recognisable substances may be caused to develop in the blood. The hypothesis that these new substances indicate the presence of anti-bodies to the tuberculo-toxin is the basis of the tuberculin treatment of tuberculosis. Clinically, we find that by injecting gradually increasing doses of tuberculin it is often possible to immunize the patient against it, and it seems that if this is done in certain tuberculous persons they develop fewer symptoms in their disease. It seems doubtful, however, whether this increase of resisting power against the tuberculo-toxin is associated with much, if any, increase of resisting power against the local mechanical effects of the growing tubercle bacilli; that is to say, though the patient has been immunized against tuberculin, yet it does not of necessity follow that he has become immunized against tuberculosis. To meet this objection it has been urged that if the symptoms caused by the tuberculo-toxins be checked, the body will be in a better position to deal with the tubercle bacilli, even though it has not acquired

a specific resisting power. Whatever may be the hypothesis which leads us to the administration of tuberculin in a case of tuberculosis, and however much we may hope to confer benefit we must remember that if there has been tuberculous infection a specific reaction will ensue after a sufficient dose, of an intensity varying with the sensitivity of the tissues at the time and the dose of tuberculin injected. All are agreed that such reaction should not be excessive, though there is a considerable difference of opinion as to the degree of reaction which constitutes excess.

In the administration of tuberculin to tuberculous persons very careful attention must be paid to the specific reaction; this is usually described as being of a threefold nature—local, focal, and general. The local reaction at the site of the injection is characterised by redness, swelling and pain. It is seldom of serious import, but may cause considerable inconvenience. Patients soon learn to dread the injections if the local reactions are frequent and severe, and great difficulty arises in persuading them to continue the treatment. The local reactions seem to be more intense if the dose given is too large or too rapidly increased, or if the interval between the injections be unduly long: the local reaction may also be taken as an indication of the approach of a general reaction, and is of considerable importance in the avoidance of an overdose in tuberculin treatment.

The focal reaction is manifested by changes of an inflammatory nature at the site of the disease. If the focus be in the lungs, visible evidence of the reaction cannot be obtained; indirect evidence is given by increased cough, increased sputum, possibly associated with hæmoptysis, and, in some instances, a change in the auscultatory phenomena. It is obvious that marked focal reaction is not without some danger to the patient, and it is very seldom that it is intentionally produced. Fortunately, the local reaction is obtained with a smaller dose than the focal response, and consequently by keeping the local reaction within bounds it is possible to avoid danger from exaggerated focal activity. In the treatment of tuberculous persons by graduated exercise in a sanatorium, it is supposed that the good effect may be attributed to the controlled liberation of autogenous tuberculo-toxins. Sometimes in a course of treatment it is found that symptoms due to the focal disease, such as cough and sputum, lessen up to a certain point and then cease to

improve. It is known that occasionally, when the case is stationary, improvement may result if an overdose of exercise be given, leading to a temporary increase in the pulmonary symptoms, and a general febrile reaction. Similarly, in the treatment by tuberculin, occasionally a dose is given sufficient to produce a definite focal response. The focal reaction is associated with considerable hyperæmia in visible lesions, and it is assumed that this is also the case when the disease is in the lungs. Possibly the focal response may be of benefit in indolent cases, in the same way that the application of a vesicant is beneficial in an indolent ulcer of the leg.

The general reaction is also of great importance. In its slighter grades there may be only a little headache, backache, or malaise, or a "far-away" feeling; when more marked there may be general pain, considerable pyrexia, and possibly vomiting. The danger of an intense general reaction is probably less than that of an intense focal reaction, but the two are likely to occur simultaneously, and consequently it is usually considered advisable to avoid both. The inconvenience to the patient of a marked general reaction is obvious, and there seems to be no evidence that it has any therapeutic advantage.

The selection of cases for treatment by tuberculin requires great care. If we assume, as seems justifiable, that many, if not most, of the symptoms of pulmonary tuberculosis are due to the absorption of autogenous tuberculo-toxins, we must exercise great caution in the injection of old tuberculin, or tuberculins somewhat similarly prepared, to patients suffering from such symptoms. This constitutes one of the great difficulties in the ambulant treatment of pulmonary tuberculosis by tuberculin. Unless the patient is under close observation, it is impossible to arrive at any estimate of the amount of auto-inoculation occurring, and the injection of tuberculin may at times produce unexpected and dangerous reactions. The thermometer is usually employed as the simplest indicator of auto-inoculation, and it is a sound rule that injections of tuberculin should be given with the very greatest caution if the temperature within the previous twenty-four hours has exceeded 99°. The cases which are most favourable for ambulant treatment are those in which the temperature never exceeds normal, and in which the extent and symptoms of the disease are slight. Of course, it is this type of case that is likely to do well under any form of treatment, and this fact constitutes a great

difficulty in forming a judgment with regard to the true value of the treatment by tuberculin. The treatment by tuberculin of patients who have fever, or many symptoms, is sometimes attempted, but it should be reserved for those who can be kept under very close observation at a hospital or other institution.

The form of tuberculin selected for the treatment varies according to the theories that appeal most to the physician in charge. Many tuberculins are on the market, but the number in common use in England is comparatively small. In their clinical effects, so far as we can judge at present, the various preparations differ in degree rather than in kind. All, if given in too large doses, are dangerous, and in all we have the same difficulty in estimating the true therapeutic value, because in undertaking the treatment we invariably endeavour to remove as far as possible the contributory causes of the disease, and to improve the hygienic surroundings of the patient.

With regard to the dosage of tuberculin, it certainly seems wise to begin with a dose not likely to produce a reaction, and to increase gradually until a local reaction occurs. In this way it is possible to determine the sensitivity of the patient, and to keep under control the focal and general response, which may be fraught with so much danger. Individuals vary so much in their sensitivity to tuberculin that it is not possible to draw up a table of doses; each dose must be determined by the effect produced by the last.

It is extremely difficult to estimate the value of tuberculin treatment: the type of case from which the best results are claimed is that in which a certain number of recoveries may be expected with other forms of treatment. Evidence is accumulating that patients, at all events in the earlier stages of the disease, do better if they receive tuberculin as well as hygienic treatment, but it does not seem probable that tuberculin alone will give satisfactory results without adequate attention to hygiene, or that it can be expected to lead to the arrest of the disease in advanced cases. On the other hand, there is no doubt that unless it is used with extreme caution tuberculin may lead to disastrous results.

STATE AID FOR A TUBERCULOSIS EXHIBIT.—The legislature of the State of Virginia, U.S.A., has appropriated \$9,000 towards providing a special train carrying tuberculosis exhibits in connection with a tour of the State planned by the West Virginia Anti-tuberculosis Society.

THE PROS AND CONS OF TUBERCULIN IN THE DIAGNOSIS OF TUBERCULOSIS.*

By H. O. WEST, M.D.,
Tuberculosis Officer, County of Kent.

THERE has been of late such a rejuvenescence—one might almost say such a resurrection—of tuberculin both as a means of diagnosis and of treatment that an attempt to sum up the position as regards the diagnostic value of tuberculin, particularly as this is now a public health question, may be of value.

Historically tuberculin has passed through many vicissitudes. Koch introduced tuberculin as a specific diagnostic and curative agent in 1890. The hopes raised were soon found not to be justified and in a few months the treatment was practically abandoned—I think almost universally abandoned in England. Individual workers, especially Camac Wilkinson in Australia, continued the use of tuberculin, and of late years there has been a resuscitation of its use. Wilkinson in particular in England has called attention to the subject, and it is largely owing to him that the idea of the diagnostic use of tuberculin has been revived.

On the other hand the latest pronouncement of the Local Government Board in a general order now in operation (February 1st, 1913), shows that the Board is not convinced, this statement being made:—"Article VIII. . . . a medical practitioner shall be deemed to have become aware that a person is suffering from tuberculosis. . . . from evidence other than that derived solely from tuberculin tests applied to that person." Such, then, is roughly the present situation, on one hand a school with a definite sense of its value, and on the other hand a body of moderate opinion awaiting conviction. Camac Wilkinson, in his book "Tuberculin in the Diagnosis and Treatment of Tuberculosis," gives the results of 20 years' experience, which fact in itself justifies his claim to a careful consideration of his statements. His main contention appears to be:—"Koch in his original paper in 1890 stated his opinion that tuberculin in future would become an indispensable diagnostic agent. I believe this claim to be true—that the disasters which led to the disuse of the re-agent so soon after its discovery were unfortunate and due to negligence in following Koch's specific directions. Koch was right—tuberculosis means a

* Paper read before the Home Counties Division, Society of Medical Officers of Health, January 15th 1913.

'tuberculin re-action' and a 'tuberculin re-action' means tuberculosis."

In view of the importance of this claim quotations may be given:—

"Tuberculin is an invaluable and indispensable agent in the diagnosis of early tuberculosis, especially pulmonary tuberculosis."

"I hold that the specific (diagnostic) re-action only occurs when there are living tubercle bacilli somewhere in the body."

"With tuberculin in our hands, whether we use it by the old or modified method of subcutaneous injection, by Pirquet's or Calmette's method, there is little or no excuse for mistakes in diagnosis."

And one quotation from a report from a municipal dispensary organized on these lines—

"If a person is suffering from tuberculosis in however slight a degree there results what is known as the 'tuberculin re-action'—by means of tuberculin the physician can detect at once in the earliest stages of the disease whether or not a person has consumption."

Here are clear and definite statements as to the value—indeed the indispensable value—of tuberculin. With the main axiom I am—and I suppose everyone is—in entire agreement. But these quotations appear somewhat too dogmatic and sweeping.

Koch in his paper in 1890 described with extraordinarily accurate detail the "tuberculin re-action" as it occurs in cases of lupus. He says: "A few hours after the injection of tuberculin the lupus spots begin to swell and redden even before the rigor begins. During the fever the swelling and redness increase and may finally reach a high degree so that the lupus tissue becomes brownish and necrotic. The inflamed area is surrounded by a broad band of bright red. When the fever passes away the swelling gradually subsides and disappears in two to three days. The phenomena have invariably developed with a dose of 0.01 c.c.m. if any tuberculous focus exists in the body, and (here comes the statement already quoted) I therefore believe that tuberculin in future will become an indispensable diagnostic agent."

Koch might have added a description of what undoubtedly often occurs, viz., the local re-action. At the site of the injection in tuberculous persons there is often swelling, redness, oedema, and firm infiltration. There may even be the formation of a vesicle.

There are thus three distinct parts in a "tuberculin re-action"—there is:—

- i. Local re-action at the site of the injection.
- ii. Focal re-action at the site of the disease (lupus patch).
- iii. General systemic re-action (pyrexia, etc.).

This paper is not concerned with the theory of such a phenomenon. The large number of explanations that have been attempted suggest that none is altogether satisfactory. It is very difficult indeed to see how a minute amount of material injected into the blood stream can produce such different and such widespread results. Wassermann and Brück take this as a starting point in their particular theory, and suppose that the tuberculin injected must leave the blood stream and become concentrated in the region of the tuberculous focus. Thus, if a person with 5,000 c.c. of blood re-acts to a dose of 1 mgm. of tuberculin the dilution will be 1 in 5,000,000. It is found that this dilution injected directly into a tuberculous lesion gives absolutely no re-action—Wassermann and Brück then proceed to argue that this attraction of tuberculin from the blood must be due to the presence in the tuberculous tissue of an anti-toxin or anti-tuberculin.

It will suffice to say that an individual infected by tuberculosis develops a certain power of response to the poisons of the tubercle bacilli. This response is in the nature of an inflammation, and theoretically it may be explained as indicating that a specific protective mechanism has been established as the result of the infection.

Perhaps the most salient fact in Koch's original cases, already quoted, is that the focal re-action is *visible*. This seems to me to be a point of the first importance, the significance of which does not appear to be sufficiently appreciated. In many cases of doubtful lupus nothing could be better than to give tuberculin—a focal re-action implying true lupus.

Apply this to the particular class of case for which this re-action, as has already been shown, is claimed of indispensable value, viz., early pulmonary tuberculosis.

The focal re-action obviously cannot be rendered visible by any method of illumination. Substitute the word "demonstrable" for "visible" and the claim may be at once admitted and no more need be said.

But it is just here that the claim seems to me to be too sweeping. Can a focal re-action in a lung be demonstrated by any known method?

In certain cases undoubtedly, and it must, I think, be admitted that where such is the case there is pulmonary tuberculosis.

Even that statement has been qualified for the reason that in certain cases, particularly in children with fibroid lungs or conditions of unresolved broncho-pneumonia, any febrile disturbance—such as arises from a general re-action to tuberculin—may cause alterations in the signs in the lungs and this might wrongly be supposed to be due to a true focal re-action.

A focal re-action in a lung is exactly similar to the re-action already described for lupus. A typical case may be described. A patient comes with symptoms suggesting pulmonary tuberculosis. A careful examination is made and the signs in the lungs are negative or, say, suspicious—for instance, we may suppose a small localized patch of quiet breath sounds. It is important to be sure of a diagnosis. Tuberculin in diagnostic doses is given. There may be a local re-action—there will almost certainly be some elevation of temperature—it may be there will be a violent general re-action, and a repeated examination of the lungs every few hours—particularly in the patch already noted, there may be some increase in the dulness, but now there are definite crepitations to be heard—that is the evidence of the focal re-action and the case is one of pulmonary tuberculosis.

Similarly in another case, say, with a cough—the signs are negative—the sputum on repeated examination is negative—tuberculin is given—there is a general re-action—the signs are still negative, but further examination shows the presence for the first time of tubercle bacilli in the sputum.

My own experience of these focal re-actions in the lung has been disappointing. Two illustrations may be given.

A nurse was sent into hospital in order that she might have tuberculin as a diagnostic agent for symptoms that suggested early tuberculosis. The first evening she was in hospital her temperature was 99°. This meant the postponement of the administration of tuberculin. She was kept in bed. In a few days her temperature was sub-normal or normal and she was given tuberculin. The temperature rose to 99°, and some suspicious signs above the left clavicle remained unaltered.

The second injection was given with a similar result. The third was given. The temperature rose to 99.8 or 100 and the physician who sent her in, though rather doubtful, thought he heard definite crepitations above the left clavicle. She was therefore diagnosed as pulmonary tuberculosis and went out to be treated in the usual way. The temperature after tuberculin

was thus very little above one noted temperature when she had had no tuberculin and the focal re-action was to say the least doubtful.

The second case is that of a little boy who at each injection gave a marked local re-action but in whom there was neither a focal nor a general re-action, and thus as regards a possible lung condition—he had a cough—we were absolutely no further.

And now what are we asked to do? Every "contact" is to be given tuberculin and if any re-action, not necessarily a focal re-action, occurs, he or she is to be treated as a case of pulmonary tuberculosis.

I have carefully read the literature of the "tuberculin in excelsis" school and I find no importance whatever attached to a focal re-action. Stress appears to be laid on a general re-action.

It appears to me that even with symptoms suggesting pulmonary tuberculosis it does not in the least follow that the tuberculosis causing the general re-action is the *fons et origo* of the pulmonary symptoms—as such a re-action may be due to occult tuberculosis.

Further investigation has shewn other ways of using tuberculin as a diagnostic agent.

These methods are known as the local tests and are as follows:—

- (1) Cutaneous, of which there are five modifications:—

Von Pirquet.
Lignières and a similar method described by Mantoux and Romer.
Morland.
Moro.
Woodcock.

- (2) Conjunctival—described and practised especially by Calmette and Wolff-Eisner.

These are well known. The first may be discussed in detail.

Von Pirquet in 1903 said, "The capacity of the tuberculous patient to re-act to tuberculin, of the vaccinated person to re-act to vaccine, and of the inoculated animal to re-act to the particular serum with which it has been inoculated are all entirely analogous and depend on the presence of the particular anti-bodies," and, commencing with ordinary vaccine lymph, he found an analogous condition of hyper-susceptibility of the skin to exist in a tuberculous patient when a small quantity of tuberculin was applied to a cutaneous lesion, and thus came in 1907 the now well-known Von Pirquet re-action.

Does this re-action take us any further?

Its diagnostic certainty is extraordinarily great. It is positive in at least 98 per cent.,

almost all children have more or less tuberculosis—that it is to their advantage to have some tuberculous infection in order to establish some immunity, and that most of them get well.

5. As to the particular methods: Tuberculin in diagnostic doses given subcutaneously undoubtedly causes a focal re-action round every tuberculous lesion in the body. As it acts so universally, with regard to the diagnosis of pulmonary tuberculosis in particular, it should, I think, “be played as the last card,” owing to the difficulty of localising the focal re-action, even if there be one. In certain circumstances it may be important to establish the diagnosis, e.g., a young man taking up a profession, a girl taking up nursing, and so on; in such cases, after all other methods have failed, tuberculin should be given; and it will be found to give positive evidence in a certain percentage of cases.

Of the focal re-actions Von Pirquet's is, I think, the best, and it is only of value in adults when negative after repetition.

A positive Von Pirquet re-action is of value in children, the value increasing as the age diminishes.

The modifications of Von Pirquet's method appear of no greater value.

CARNARVONSHIRE COMBINED SANITARY DISTRICTS.—The annual reports of the three medical officers of health are summarized by one of them—Dr. Parry Edwards—who is in charge of one of the divisions. In the rural districts the infantile mortality rate was 105.1 per 1000, and in the urban districts 131.8, the total for the combined district being 114.8. The fact that one out of every ten deaths among infants is uncertified is noted, and the adoption of the Notification of Births Act is strongly advised, more especially as 40 per cent. of the infants die before they attain the age of one month. The illegitimate birth rate was 7.7 per cent. of the total births. For this the very poor housing conditions and inadequate sleeping accommodation are largely held to be responsible. In relation to tuberculosis, the death rate from which was 2.08 per 1000, housing is again referred to, and the necessity for taking active steps in connection with it, as also in connection with sanitation generally—sewerage, scavenging, etc.—is strongly urged. Since the Housing, Town-Planning, etc., Act, 1909, came into force, there has been some increase in activity, but in agricultural—quarry districts especially—much remains to be done. Artizan dwellings chiefly are required. The report contains numerous photographs shewing works which have been done—new baths, an open-air school and a public abattoir—and works requiring to be done, mainly in connection with houses condemned as unfit for habitation.

THE SELECTION OF PATIENTS FOR SANATORIUM TREATMENT.*

By F. C. SHRUBSALL, M.D., F.R.C.P., D.P.H.

‘LIFE is short and the art long; the occasion fleeting; experience fallacious, and judgment difficult. The physician must not only be prepared to do what is right but to make the patient, the attendants and externals co-operate.’ These are the opening words of perhaps the oldest treatise on medicine still read, but they might have been written as a commentary on the problems arising out of ‘Sanatorium benefit.’

Sanatorium treatment is of immediate interest as the hopes of many have been raised by the rosy conditions depicted in certain organs of the daily press. None the less it appears that the available resources, though large, are limited, and it is a matter of the deepest importance to the individual and the State that these shall be duly husbanded and wisely laid out. Tuberculosis must therefore be considered from the standpoint of social economics as well as from that of clinical medicine and public health. There is no absolute panacea for the disease, no method which will certainly cure advanced cases, so that in any consideration of the subject of sanatorium treatment it is essential to keep clearly in view its aims and limitations. Some difficulties arise from the nature of the institutions, others from the peculiarities of the disease.

What is a sanatorium? This is perhaps easiest understood from a brief survey of the evolution of this method of treatment. The germ of the idea arose at some period in the pre-history of medicine. In the earliest writings the value of a life in the open was realised. Hippocrates advised gentle outdoor exercises, especially riding on horseback. Celsus advocated riding, driving, sea voyages, and for those who were weaker hammock exercise in the open air.

Some thousand years later a mediæval physician prescribed that his patients should rise early in the morning, go into their gardens and themselves find and forthwith eat six snails. A combination of the fresh air cure with fatty dietetic treatment, which also contains the germ of the method of graduated exercise; since, as the patient grew stouter, he would find it a task of increasing difficulty to find the said snails. The importance of environment was noted by Buchan in 1783, when he stated,

* Paper read at a Meeting of the Metropolitan Branch of the Society of Medical Officers of Health.

“On the first appearance of consumption, if the patient live in a large town or any place where the air is confined, he should quit it and take choice of a situation in the country where the air is pure and free. Here he must not remain inactive, but take every day such exercise as he can bear.” Buchan also recommends carriage exercise and notes—“a long journey, as it amuses the mind by a continual change of objects, is greatly preferable to riding the same ground over and over.” This importance of the mental attitude cannot be overlooked, and is second to none among the considerations which should govern the treatment of individuals at the present day. The physician must never forget he has to treat patients and not diseases. In 1830 attention was drawn to the value of daily outdoor exercise without paying too much regard to the state of the weather.

For some 65 years after this it was the practice of many practitioners to attempt to secure open air conditions with only moderate exercise by sending their patients for long sea voyages, but the results of this treatment were none too satisfactory.

The modern sanatorium was inaugurated in 1840 by Boddington at Sutton Coldfield. He realised the necessity for constant supervision, and therefore for collecting patients together in one community, and drew attention to the disadvantages of an indoor life, saying that the equable temperature at that time demanded for treatment should be that of the outer air. He also recommended that provision should be made for the employment of convalescent patients who ought not to return to their previous occupations. Unfortunately Boddington's ideas were ridiculed and only bore fruit after transplantation to German soil.

In 1859 Brehmer opened the pioneer sanatorium at Görbersdorf in Silesia. His central aim was to strengthen the heart. He had noted that while most consumptives had small hearts, the inhabitants of mountainous areas in which tuberculosis was very rare, had large hearts, and concluded therefrom that the larger heart had conferred the immunity. The general features of his treatment were:—

- Life in the open.
- Freedom from debilitating surroundings.
- Methodical hill climbing.
- An abundant fatty dietary.
- Various hydrotherapeutic measures.
- Constant medical supervision.

Somewhat later Dettweiler, a patient and later an assistant of Brehmer, introduced the liegekur system in his sanatorium at Falkenstein. He made less use of graduated exercise,

but directed his patients to lie for hours together in open shelters, the liegehallen. He made a great point of feeding, proclaiming the kitchen to be the true pharmacy of the sanatorium. His methods, though modified to some extent in the direction of increased exercise, are those now adopted at the majority of continental sanatoria for paying patients.

Walther of Nordrach, from attracting many English patients, was the re-introducer of the sanatorium to this country. He abandoned the liegehallen, which he is said to have called quarrelling halls, as giving insufficient rest, and kept his patients in their own rooms or on balconies during the rest periods. He advocated progressive and extensive walking exercise, and a stuffing dietary. The majority of the private sanatoria in this country have been modelled on his system. From this arose the use of sleeping chalets, which have been found adapted to home use and have spread extensively in connection with the dispensary system brought to the front by Sir Robert Philip.

The creation of sanatoria for the working classes in Germany led to a certain amount of work about the institution being carried out by the patients, who were found in most cases to benefit by the occupation, and gradually a system of graduated work as well as of other forms of exercise came into existence. This system has reached its most complete phase at Frimley, under the guidance of Dr. Paterson, and is now generally adopted in modified forms. Though empiric, if not indeed accidental, in its inception, the method has been placed on a rational basis by the investigations of Drs. Paterson and Inman, who shewed the feelings and symptoms of the patient were in large measure reflected in the changes of their tuberculo-opsonic index. The system, in brief, ranges from absolute rest in the case of those showing any signs of auto-inoculation, through a graduated series of increments of exercise and manual labour regulated chiefly by the temperature and general feelings of the patient, to the six hours' hard work a day, prior to discharge, of those in whom the disease is believed to be arrested. Under this regime the sanatorium shades into, if indeed it does not become, the labour colony.

Since in the last ten years all the consumption hospitals and the special wards of the infirmaries have adopted as far as possible open-air methods and some degree of graduated rest and exercise it is possible to include these, and even some homes for advanced cases,

adopted for any individual it is necessary to consider his clinical condition, his prospects of future work, his social environment and his educability.

Sanatorium treatment, if it means a serious attempt at cure, or even a long restoration of working capacity, is not a matter of a few weeks but runs into months. During this period there must be resources to aid the home or the patient, once he has begun the scale of graduated labour, will refuse to stay. Unfortunately these patients are usually those with the keenest sense of their responsibilities to their families, with the best moral calibre, and therefore those for whom most could and should be done. It is difficult to blame their action however much its wisdom may be doubted.

From the educational side it is useless to carry out the complete sanatorium method with those who will not be taught, and if the experience of the health visitor or nurse and of the hospital staff leads to this diagnosis the patient should be limited to 'hospital treatment,' which can cover a good deal of graduated work if the patient will carry it out. At the same time it is well to note that the absence of facilities for occupation of a productive nature is a weak point at present in hospital administration and tends in some instances to undermine the moral calibre of the patients.

From the social and economic side it must be borne in mind that the convalescent patient needs to live under the most favourable circumstances available; that a suitable environment is usually more expensive, so that it cannot be obtained by one who cannot earn "good money." A return to the conditions of intermittent casual labour almost inevitably means a speedy recurrence of illness. This, from the medical aspect, is an argument for labour colonies, but these are not easily placed on a reasonable financial basis. From the practical standpoint of the selection of cases it means that where and when there is only a limited number of genuine sanatorium beds available, these would be most profitably utilised by the skilled workman who could return to a trade or occupation bringing in an adequate income, provided he fulfilled the clinical and educational requirements. In any case the patient must return to the best paid occupation reasonably available. It is better to work under slightly worse conditions and be able to live well than to have a more ideal

occupation and suffer privations. Starvation is a worse enemy than tuberculosis. If treatment in a labour sanatorium will not restore a patient to work at his trade it has failed in its purpose.

Turning to the clinical aspects of the selection of cases the problem is no less difficult, diagnosis must be reasonably certain. Extensive disease readily recognisable by anyone, broadly speaking, contra-indicates hope of prolonged benefit, yet physical signs in the chest are of secondary importance in deciding on a line of treatment. Latham pointed out many years ago "Pulmonary consumption is no more than a fragment of a great constitutional malady which it would be vain to think of measuring by the stethoscope and which it belongs to a higher discipline than any mere skill in auscultation rightly to comprehend." Even now with the numerous tests based on the response to inoculation with bacterial products it is impossible to distinguish between a recently quiescent focus of infection, and one which has been arrested and dormant for many years. It is necessary to estimate the degree of general affection, the signs of intoxication by bacterial products, and the powers of resistance of the patient. In these matters we have still to rely on observation as in the days before Laennec. Perhaps the more important points are the patient's appearance, considered in due relation to any history of privation, his feelings, appetite and weight, the temperature, the appearance and quantity of the sputum, and the presence of undue myotatic irritability, or of myoidema. Of these the temperature most often serves for a preliminary classification.

Prolonged fever is as a rule unfavourable unless it may be explained by a lack of rest which has allowed of continuous auto-inoculation, in cases offering much hope absolute rest will lead to a fall of temperature, though this may be spread over a considerable period of time. The degree of pyrexia is a measure of the activity of the disease, and marked fever is associated with a spread of the tuberculous process. The type of pyrexia may give an indication of the dominant morbid process. Continuous fever of a high grade, with slight morning intermissions or of an inverse type is associated with miliary tuberculosis, whether general or local. High remittent or intermittent fever accompanies acute caseous tuberculosis, while in fibroid cases the temperature may be subnormal for days together. In

ordinary chronic fibro-caseous tuberculosis there is often intermittent fever, the height varying with the activity of the process and the degree of bacillary intoxication.

It is essential that the temperature of the patient should be taken four-hourly for several days, especially if he has been moved, as this often affects the type of temperature.

If the term 'sanatorium treatment' be reserved for the method of graduated exercise, it is undesirable to send those whose temperature exceeds 99.5. Such cases need rest and nursing, and so fall under the heading of hospital cases.

The patient's prospects are on the whole inversely proportional to the quantity of sputum, though it is advantageous for him to remove softened caseous material from the lungs. Considerable amounts of sputum mean extensive lesions. It is necessary to be quite clear that a case is not one of bronchiectasis, although bronchiectasis and tuberculosis are not uncommonly found together, and there may be doubt as to which was the primary lesion. Cases of bronchiectasis are more suited to hospital treatment.

A patient who feels well and able to work, has a good appetite and digestion will usually respond to treatment. One who feels ill or out of sorts, and has a poor appetite and digestion, must be regarded with suspicion even though the temperature remain normal, but the cause of the condition may not be the tuberculosis.

If a patient always complains of cold, and suffers from catarrhs or asthmatic attacks under an open air or even an open window regime, sanatorium treatment is likely to be of little avail save, perhaps, in the summer. If he complains with the return of colder weather, it is doubtful if he should be compelled to stay. Although most tuberculous patients are, or become, very tolerant of cold, a bronchitic type not so tolerant certainly exists. Possibly the prognosis is less good in such instances, but most must be aware of individuals who resolutely shut themselves up in the warm and live many years longer than had been anticipated. The old method of living in a uniform temperature could not have held sway so long had none done well under such treatment. It is, however, only for the exceptional case that this could be recommended.

Appearance goes a long way; cases of phthisis, at any rate phthisis of any standing, rarely do well enough to count as cures or even to return

to work under ordinary conditions for long periods. Phthisis means a considerable degree of septic intoxication, though possibly opposed by a good resistance. Myoidema is commonly present in such cases, it indicates an ill-nourished condition of the muscles, accompanies auto-intoxications of various types and has an adverse prognostic significance.

A well-maintained weight is a good sign. The weight falls in the acute stages and is recovered when fever abates. A slow but steady loss is unfavourable unless the circumstances have been adverse.

Consumptives of the labouring classes who have been some time out of work may be suffering as much from partial starvation as from the lung disease. The gain of weight in hospital is often proportional to the previous loss, and it has been noticed that it is those who have had the hardest struggles who respond best to the change in their circumstances.

If a wide meaning be attached to the term Sanatorium every case is suitable for some form of such treatment; it seems, however, better to restrict the use of the word to institutions at which the full course of exercise treatment can be administered, while allowing that 'sanatorium benefit' may be obtained at hospitals or homes for advanced cases. The hospital could serve as a clearing house. In London the majority of cases might pass the preliminary stages in an institution of this type, and only when ready for more advanced exercise need they be transferred to a distant sanatorium. Where new institutions are required the probationary hospital might be as far as possible in the country, provided the situation was easy of access, and for small areas it might be combined with the sanatorium proper to reduce administrative expenses. The chief drawback of such a course is that the institution gets the credit of failure for all cases found unable to progress to the full course of treatment.

The most difficult problem in prognosis is to determine if a patient in the very early stages should give up work and receive residential treatment. If he feels ill this is the best course. If he does not, as is the case with many discovered by an examination of contacts, provided his temperature is normal, and there are no signs of progressive loss of weight and appetite, he could remain at work under supervision. If there is some evidence of lowered health in an afebrile patient, the effects of a temporary change to an educational sanatorium might be tried, or he might be admitted

either to a sanatorium or hospital for further investigation, either by tests of the tuberculo-opsonic index or by the subcutaneous tuberculin re-action. If a focal re-action be obtained he should undergo a course of sanatorium treatment. A general without a focal re-action is of less import, and it is neither feasible nor desirable to undertake the full sanatorium treatment of those diagnosed as consumptive solely on a positive result to the ophthalmic or cutaneous tuberculin re-actions. The lesions in such cases may be very old. Still more does this apply to the results of routine testing of contacts by these re-actions, for the bulk of the cases thus discovered are individuals who have recovered or would recover without becoming aware of the infection. It is most undesirable to run the risk of undermining the moral fibre of a patient by making an invalid of him unnecessarily. It is enough to keep such an one under supervision and devote attention to improving the conditions of the home, and these steps are just as necessary if the re-action is negative or if the test has not been made.

It is difficult to estimate the effects of vaccine therapy on the future of the treatment of tuberculosis. Tuberculin has been used in various ways since its discovery, and the present difference of opinion is enough to shew that it does not work marvels. That the symptoms of tuberculous patients may in some cases be modified by the employment of tuberculin is certain, but it is equally clear that while the patient is sheltered from the symptoms of bacillary intoxication the disease may progress to a fatal termination. Very few reports of series of parallel cases, one set treated with tuberculin and one without, are available—one of the most recent is emphatic in the conclusion that those not so treated did best in all immediate respects. On the other hand most reports seem to indicate that the administration of this drug leads to a more rapid disappearance of tubercle bacilli from the sputum, a factor of great importance to the public health.

If, as some allege, all early cases can be treated effectively by this method at home while remaining at work, the sanatoria could concentrate on the restoration of the working capacity of the intermediate cases. For evidence on this point only cases with tubercle bacilli in the sputum can be accepted lest the diagnosis be in dispute, for we already know that the great majority of cases diagnosed on other grounds

and in the absence of physical signs recover. If the ophthalmic and cutaneous re-actions are to be trusted, tuberculosis is as common and as readily recovered from for all practical purposes as is measles.

The clearest course at the present moment would be to send to sanatoria all early proven afebrile cases of tuberculosis, but not to base a positive diagnosis on any one group of signs except it be the presence of tubercle bacilli in the sputum. But to keep under observation and education all types of doubtful illness. Lastly, to put more faith in measures of public health and the spread of hygienic education than in any specific treatment whatsoever its nature.

LUPUS IN GERMANY.*

DR. NIETNER describes the activities of the Special Commission established in Germany to combat lupus. The objects of the Commission are to facilitate the erection of institutions for the treatment of lupus; to help, where necessary, in the purchase of the necessary apparatus; to encourage provision of accommodation for lupus patients near the institutions at which they are being treated; to provide free treatment for the poor; and to develop, as far as possible, the means for treatment and care of patients suffering from the disease.

A census, taken on November 1st, 1908, of the number of cases of lupus in Germany gave 11,354 as being under medical treatment. Allowing for those who were at too early a stage of the disease for certain diagnosis, and for those who were at too late a stage for treatment, it is calculated that the total reached 33,000. About two-thirds of the cases under treatment were females.

The Lupus Commission has given grants towards the cost of electric current for light-treatment, towards the cost of patients' journeys to the treatment centre, and, in exceptional cases, towards the support of the family where the patient has been admitted into an institution.

The treatment has been chiefly Finsen rays, though other methods have also been used in some cases.

From the National Insurance statistics it appears that during 1910 868 cases of lupus were treated under the insurance scheme. A more detailed analysis shows that under the conditions of treatment in force in the past the results of treatment have not in all cases been permanent. Thus, of those patients who, up to the end of 1909, were reckoned as cured—foruing 80 per cent. of the males and 92 per cent. of the females treated—31 per cent. of the former and 44 per cent. of the latter had relapsed by the end of the following year. In spite of this, however, it is evident that valuable work is being done in Germany in the eradication of lupus.

* Measures against Lupus in Germany. Nietner (Berlin). Strahlen-therapie. Bd. 2, Heft 2.

SOME RECENT STATISTICAL WORK ON TUBERCULOSIS.

By MAJOR GREENWOOD, JUN., M.R.C.S., L.R.C.P.

SOME years have passed since the sanatorium treatment of consumption began to be adopted on a large scale, and the alternative or complementary method of tuberculin injections has also been tried on many thousand patients. To-day we stand on the brink of new developments in our collective attitude towards the tuberculosis problem. Enormous sums of money are to be expended and it is our clear duty as citizens to endeavour to take stock of the results achieved in the past so that we may make the best use of the opportunity now afforded us. The words of Clough may well serve as a motto in the campaign against tuberculosis:—

"Old things need not be therefore true,
O brother men, nor yet the new;
Ah, still awhile the old thought retain,
And yet consider it again."

Here, as in so many departments of medicine, one of the chief difficulties has been to render a really intelligible account of what has been done. The administrator and publicist naturally expect that medical experience should be translated into the universal language of arithmetic and demand numbers and percentages.

But many people whose familiarity with the subject matter is great have been so impressed by the difficulty of clothing their results in numerical form that they have abandoned the attempt. Then, again, some who did employ the numerical method have not been sufficiently alive to the special technical knowledge which the process demands; consequently their publications have repelled the trained statisticians, and the latter have, in their turn, emphasised the necessity of an adequate statistical calculus. The consequence has been that the main problem has tended to be obscured by discussions as to the method by which it ought to be investigated, and there are not wanting signs that the adoption of certain methods is apt to be regarded as an indication that the worker necessarily subscribes to certain views or theories. The publication of Messrs. Elderton and Perry's "Memoir on the Mortality of the Tuberculous"* is therefore opportune, and a

* A Fourth Study of the Statistics of Pulmonary Tuberculosis: The Mortality of the Tuberculous: Sanatorium and Tuberculin Treatment. Based on (1) Dr. Lawrason Brown's Adirondack Sanatorium Data. (2) Data from two Scottish Sanatoria. (3) Dr. Austin Flint's Data from Pre-Sanatorium Days. By W. Palin Elderton, F.I.A., and Sidney J. Perry, A.I.A., pp. 35. London, 1913. (Drapers' Company Research Memoirs—Studies in National Deterioration VIII. Dulau and Co., price Three Shillings.)

consideration of its contents will repay all serious students of the tuberculosis problem.

The data investigated by these authors were supplied from several sources. The main series, running to 3,000 cases, was derived from the Adirondack "Sanitarium," shorter series being furnished by the Ayrshire and the Bridge of Weir Sanatoria. Some three to four hundred cases obtained from the private records of the late Dr. Austin Flint were available for comparison between the results of modern and mid-nineteenth century treatment.

The statistical method employed was that used by actuaries in their ordinary work, i.e., a comparison was made between the number of deaths actually occurring and the number which would be expected to occur if the mortality rate upon which the English Life Table (No. 6) depends held for the persons under examination. On the question of method we may here interject the only criticisms which seem called for. In some of the tabulations the size of the experience is small, and the calculated mortality is subject to a large error of sampling. Such error cannot be evaluated with the help of ordinary tables of the normal curve, but would need special calculation in each case owing to the skewness of the error distribution when the chances of dying and not-dying are widely different. These facts have to be borne in mind if stress is attempted to be laid upon any particular tabulation, but none of the conclusions drawn by the authors are likely to be modified by taking into account the "probable errors."

The other point is that the English Life Table is not perhaps altogether satisfactory for American lives, as the authors remark, but no suitable American table could be found. The consequence is that the "expected" number of deaths should simply be regarded as an arbitrary standard in terms of which the experience of different series can be compared. The chief drawback of the method is felt when we compare modern American experience with that of Dr. Austin Flint's time, 1845-70. The English table relates to a more recent period, and the mortality at the ages of importance has decreased some 20 per cent., so that the "expected" deaths are too low and the apparent excess mortality of the tuberculous too great.

We may now turn to the results. The Adirondack data were divided into three sets of 1,000: the first comprised admissions between 1885 and 1897, the second cases from 1897-1903, and the third those from 1903 to 1909. The

classification by state of disease was into incipient, practically equivalent to Turban's Stadium I.; moderately advanced, chiefly composed of Turban's Stadium II., and far-advanced, mainly Turban's Stadium III. The result shows, as was to be expected, that the mortality was heaviest in the far-advanced and least in the incipient cases. Following the cases from admission, there is a general improvement as we pass from the first to the third thousand, but in every group, except the females (incipient cases) in the third thousand, the ratio of observed to expected deaths is greater than unity. If we take the history from discharge, the ratio (both sexes together) in the case of apparently cured persons is 2.6 in the first thousand, 1.9 in the second, and 0.6 in the third. From a consideration of the relative proportions of incipient, advanced, and far-advanced cases at each epoch, it is plain that far fewer severe cases were received as time went on. Thus the numbers of incipient cases per thousand were in the cases of males, 77, 144, and 222; in the case of females 123, 157 and 206 in the three sets. The authors hold that "it is highly probable that the average case included in the incipient class among the first thousand was nearer to the advanced class than the average case of the incipient cases among the first thousand." We do not, however, appreciate the grounds upon which this conclusion is said to be highly probable. It would no doubt be true if each 1,000 were a random sample of the tuberculous persons existing at the time, but as they are probably selections the point partly depends upon the rigidity of the classification. The authors have classified all cases together, in accordance with the presence or absence of bacilli in the sputum, but have not separated the contributions of the three sets of 1,000. It would have been interesting to see if these proportions varied in the incipient class from the first to the third epoch.

The Adirondack data are considered from several other points of view, e.g., the mortality of patients known to have hæmoptysis is separately examined, and also that of those patients one or both of whose parents had consumption. In the latter case it appears that if a person actually has consumption it does not make much difference to his prospects of dying whether his parents had consumption or not. This, of course, has no bearing on the question as to whether the offspring of tuberculous persons are or are not more liable to develop the disease than the rest of the population.

The cases treated with tuberculin are separately considered, and it appears that the incipient cases treated with Deny's tuberculin (T. B. F.) showed a slightly lower and the advanced cases a slightly higher mortality than that of the third thousand as a whole. Since it was not practicable to divide up the data into separate groups for each kind of tuberculin, and since there is at present much dispute, both as to what tuberculin ought to be used and as to how the dosage should be regulated, this part of the inquiry is of minor importance. The same remark applies to the analysis of the Scottish data, in respect of which far less information was available than in the case of the American Sanatorium.

Finally, we may notice Messrs. Elderton and Perry's analysis of the pre-sanatorium experience of Austin Flint. The ratios are 11.7, 23.1 and 100 for incipient, advanced and far-advanced cases, as compared with 2.3, 7.4 and 11.1 for the third thousand of the Adirondack experience. *Prima facie* this indicates an enormous superiority in modern times, but, as the authors are careful to point out, the comparison is largely vitiated by uncertainties of classification, and they remark, "We must remind our readers, too, that any comparison between sanatorium results and 'pre-sanatorium' records is open to considerable criticism; many difficulties in this connection have already been indicated, and alterations in diagnosis, or in the selection of cases, go a long way towards making it impossible to conclude with certainty whether the mortality is lighter now than it was in the earlier times. In Flint's cases, for instance, it is clear that no one can say whether allowance for the various possible influences that have been mentioned would be sufficient to reduce the mortality by the 50 per cent. necessary to bring it to the same rate as that shown by the first thousand Adirondack cases."

"We hope that some improvement has taken place, but it is far less than has sometimes been stated."

We do not know to what the authors refer in the last sentence quoted, but we accept their estimate of the value of such a comparison as here presented. We do not think any scientific comparison can be made between the results of sanatorium and pre-sanatorium days.

From the preceding analysis the reader can form some idea of the nature of Messrs. Elderton and Perry's work. In conclusion, it may be asked what fresh light has been thrown

upon the tuberculosis problem. Professor Karl Pearson, who contributes an introductory note, thinks that "the reader who peruses carefully their pages will agree with me, that what is above all things needed to-day in view of the expenditure of millions of pounds under the National Insurance Act—on the practically universal treatment of phthisical patients, by what will in all probability develop into a routine of tuberculin dispensaries and sanatoria—is the immediate expenditure of a few thousand pounds on a more thorough study of the origins of phthisis and of the relative value of existing and alternative treatments."

The need for further investigation does seem clear. All that Messrs. Elderton and Perry's careful investigation appears to establish is that the expectation of life of persons suffering from tuberculosis, however treated, is less than that of persons not suffering from tuberculosis. This is a proposition to which the most enthusiastic adherent of the sanatorium method would find no difficulty in assenting. Were we able to take the results yielded by the Flint series at their face value we should have to regard the sanatorium results as a great improvement; but, as we have seen, the comparison may be fallacious. Very exaggerated claims on behalf of sanatorium results have no doubt been made by a few extremists, and to those who have been impressed by such statements, Messrs. Elderton and Perry's memoir will be a useful tonic. The vast majority of medical men, we apprehend, regard both the sanatorium and the tuberculin methods as being based upon ideas in conformity with our present knowledge of the pathology of tuberculosis, and *pro tanto* valuable and worthy of extension. They do not imagine that any method whatsoever is, in the long run and on the average, likely to put a phthisical person into the same position as another person of the same age who has not suffered from the disease. To any who hold these views the results reached in the memoir under notice will be no surprise.

We must not extend this review—already, perhaps, unduly prolonged—by dwelling upon subsidiary points; we think it possible, as already hinted, that the authors tend to over-emphasise the part played by selection in lessening the mortality of the later experience, but we recognise that their conclusion is quite compatible with the facts. We desire to take leave of them with an expression of gratitude

for the care and patience which characterise their work, and of a hope that they will return to the subject in the future when more material may be ready for analysis.

COUNTY OF LANARK.—The report of Dr. J. T. Wilson for 1911 deals with the county areas of Lanarkshire and the districts for which he is responsible. It contains a number of special reports with regard to such matters as rivers pollution prevention, outbreaks of infectious disease, etc., and from the medical superintendents of the fever hospitals within the county. To rivers pollution prevention, especially, great attention, as usual, was given throughout the year. Coal dross washers, paper mills, distilleries and other sources of pollution were regularly inspected and a considerable number of pollutions were detected and dealt with. One of the outbreaks of infectious disease enquired into was of scarlet fever—all the cases being associated with one milk supply. The fullest enquiries were made and though some difficulty was experienced, the source was eventually traced to a young man who had attended a festive gathering at the farm from which the milk was obtained while in an infectious condition. Referring to the great diminution which has taken place in the numbers of cases of typhoid fever in certain districts, Dr. Wilson attributes this to the removal of privy middens, the introduction of water closets and the improvement in general cleanliness which has followed the formation of special scavenging districts. In connection with housing, reference is made to an interesting appeal against an order made by one of the district committees under Section 15 of the Housing, Town-Planning, etc., Act, 1909, requiring that a sink and water supply should be introduced into each one of a number of houses. On the ground that the absence of these appliances did not necessarily render a house unfit for habitation and that he himself had doubts as to the advisability of introducing them into old houses of the class dealt with, the Sheriff-substitute allowed the appeal, as in his opinion the whole question was one of fact and not of law. He refused to state a case, but a full report has been sent to the Local Government Board in the hope that some provision may be made, in future amendments to the Public Health (Scotland) Act, to deal with the question of water supply and sinks. A note with regard to certain observations made by Mr. Cameron, superintendent of Bellshill public slaughter-house, on congenital bovine tuberculosis, showing that the amount of tuberculosis present in newly-born calves varies from .5 to 1.5 per cent., and in the generality of cases is due to tuberculosis of the uterus, is included in the report.

THE SOUTHAMPTON TUBERCULOSIS SCHEME.*

By R. E. LAUDER, M.D., F.R.C.S., Ed., D.P.H.,
Medical Officer of Health, Southampton.

IT is now over seven years' since the Southampton Corporation reserved accommodation at the Borough Isolation Hospital for treating tuberculosis. In June, 1911, the Council resolved to open a dispensary, and early in the following year its tuberculosis medical officer and nurses were appointed.

It will be seen, therefore, that the local authority acted before the issue of the Astor Report in May, 1912, and was in a position to offer sanatorium benefit when the Insurance Act came into operation in July.

During the seven years' work the methods have been altered and improved as indicated by experience, so that it has been possible to lay down a complete scheme for 1913, the component parts of which have been previously tried and found to work well. The work under this scheme is carried out as far as possible on a definite and routine plan, as in this way may results be best compared.

The following notes give a brief outline of the scheme now in operation at Southampton, and may be found of some use to others who have as yet not completed their arrangements.

POPULATION:—122,412.

STAFF:

Medical Officer of Health.

This officer is chief tuberculosis officer to the local authority and medical adviser to the local Insurance Committee, and the entire scheme is under his control.

Tuberculosis Medical Officer.

This officer is directly responsible to the medical officer of health for the working of the scheme. He controls dispensary treatment, sanatorium treatment, bacteriological work and regulates home visiting and methods of prevention.

Resident Medical Officer, Isolation Hospital.

The sanatorium, which is in the grounds of the Isolation Hospital, is visited regularly by the chief tuberculosis officer and tuberculosis medical officer. When these officers are absent the patients are under the care of the resident medical officer, who attends to all emergency work and records the daily observations concerning each patient.

Two Tuberculosis Nurses.

One nurse devotes the whole of her time to home visiting, whilst the other waits on the

tuberculosis officer at the dispensary when patients are attending, and spends the remainder of her time in special visits to homes.

Sanitary Inspectors.

All disinfection of houses, etc., is carried out by inspectors of the Health Department, who also supplement the dispensary work in the distribution of disinfectants, sputum flasks, etc.

Hospital Nurses.

The sanatorium is staffed by nurses specially selected from the Isolation Hospital staff.

Caretaker of Dispensary and Wife.

These live on the dispensary premises.

Clerical Work.

Outside the clinical records at dispensary and sanatorium this is done by the Health Department. The work occupies the time approximately of one clerk.

ACCOMMODATION.

Dispensary.

This is converted from a large double-fronted house facing a public park and situated centrally. It contains on the first floor (1) a large waiting room, which is also used for the purpose of lectures by doctor and nurses to dispensary patients; (2) nurses' room where patients are first interviewed; (3) two dressing rooms which lead from the nurses' room and have additional doors entering the consulting room; (4) consulting room; (5) X-Ray room; (6) medical officer's room for statistical work; (7) patients' lavatory and (8) a dispensing room.

On the second floor there are (1) the laboratory; (2) a dark room for photographic work; (3) a store room; (4) room for extension; (5) caretaker's kitchen and (6) the staff lavatory. The third floor is devoted to sleeping quarters for the caretaker.

The ground floor contains six rooms, which are now being converted into a school clinic; the patients attending this clinic will be admitted by a separate entrance opening from another thoroughfare.

The dispensary is warmed and lighted by electricity; water heaters, sterilizers, incubators and centrifuge are worked by electricity.

The X-Ray apparatus has been supplied according to specification and includes Dr. Jordan's special protective screen and his saddle chair for securing the patient.

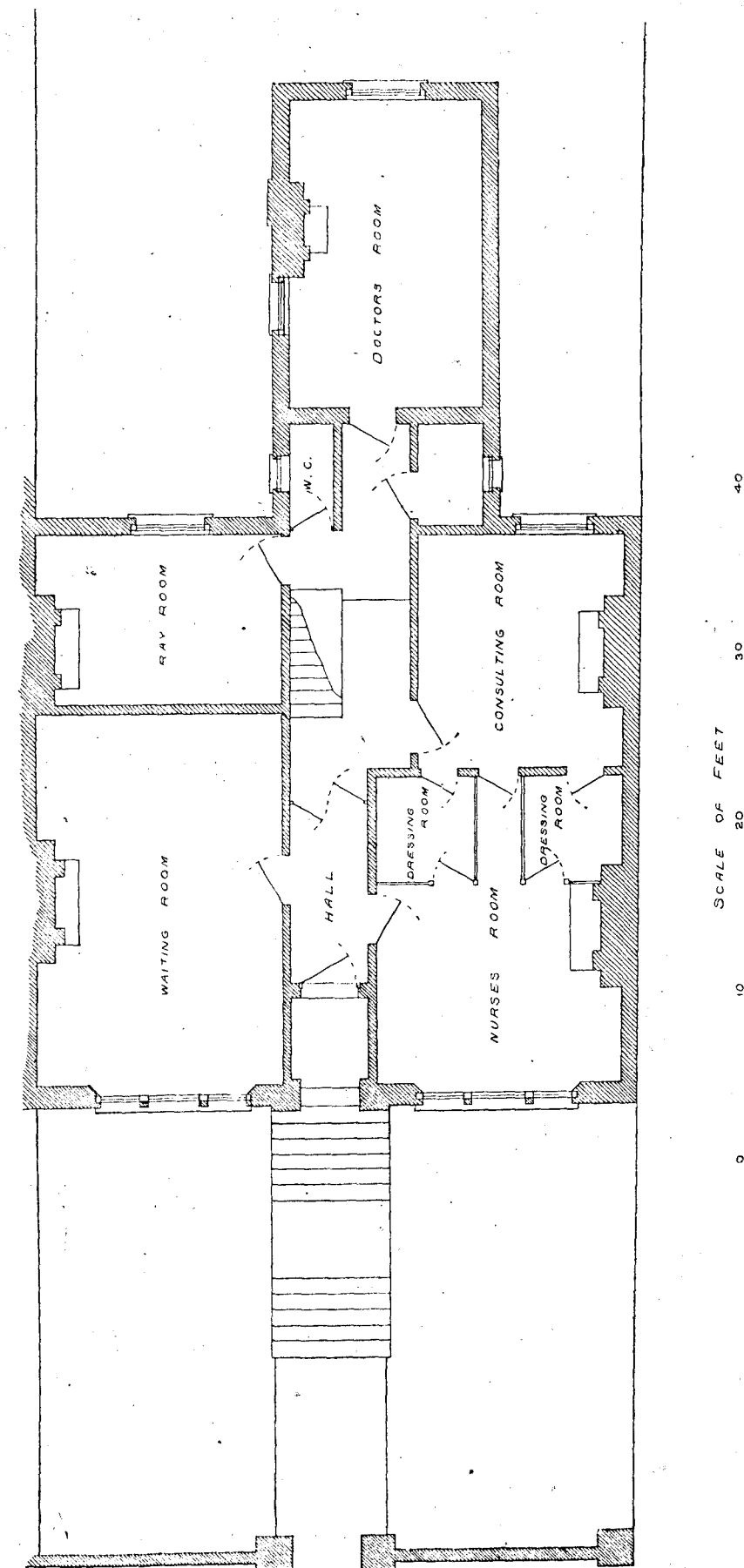
Two wards at the Isolation Hospital, with accommodation for 34 beds, and three side wards, are devoted to tuberculosis treatment.

For a population of 122,412 this allows more beds than suggested in the Astor Report. Experience of local requirements would indicate

DISPENSARY

MUNICIPAL

SOUTHAMPTON



*Read at a Meeting of the Southern Branch of the Society of Medical Officers of Health.

double the number of beds mentioned in this report to carry on the work satisfactorily.

Having three side wards, it is possible to separate cases to some extent, but a more desirable arrangement would be four wards of 10 beds each, one for male early cases, one for male advanced, and the same for females, with special receiving rooms and side wards for observation.

It may be of interest to note here that there is no single instance of a patient in the tuberculosis wards having contracted an infectious disease during the seven years they have been open, although the nurses are housed in the same administration block as the fever nurses, and use the same dining and sitting rooms.

The dispensary, sanatorium and health office are in direct communication by telephone.

ROUTES BY WHICH PATIENTS COME UNDER THE MUNICIPAL SCHEME.

The dispensary is essentially the centre of all methods of treatment and prevention. It occupies the same position as that laid down for dispensaries in the Astor Report. All cases are dealt with in the first instance by the dispensary staff.

There are five ways in which patients come under notice:—

(1). *Notified Cases.* When a notification is received at the Health Office a copy is transmitted immediately to the dispensary, where the name, address, etc., are entered in the case ledger and visiting ledger. As soon as possible the case is visited and investigated by the dispensary nurse, who fills up a form (Form 3) containing full particulars of home conditions, as to suitability for isolation, treatment, etc. At this visit the nurse may discover that the patient or doctor desires the local authority to undertake treatment; if such be the case, the nurse supplies a form of application for the doctor to fill up. If no such desire be expressed, the nurse simply gives advice on the preventive aspect, supplies a sputum flask and disinfectants and fills up her form of particulars. This form is submitted to the tuberculosis officer, and if, in his opinion, the case should come under the municipal scheme either he or the nurse communicates with the doctor and ascertains his wishes; if he desires municipal treatment he is asked to fill up the usual form recommending this.

It is an instruction to the nurse not to influence a patient to abandon his doctors' treatment for municipal treatment (the object of the scheme is attained without the nurse so soliciting).

When the application form is returned the nurse again visits the patient and makes an appointment for him to be examined at the dispensary.

If after the above routine the case does not come under the municipal institutional scheme of treatment, the nurse visits the home as often as circumstances indicate in regard to preventive measures, and treatment is left to the practitioner attending. A child notified by the school medical inspector is dealt with as above described, but communications regarding treatment are made with the family doctor, if there be one.

(2). *Insured Cases.* The local authority provides dispensary and sanatorium treatment for the Insurance Committee. When an insured patient is notified he is informed that he may apply for sanatorium benefit. Form Med. 2 of the Insurance Commissioners applying for such benefit is filled up by the panel doctor and sent to the medical officer of health; this form is sent to the dispensary and is entered in the ledger; a nurse then immediately visits the patient and makes an appointment for examination by the tuberculosis medical officer.

(3). *Contacts.* Except in the better class homes (and these are visited as often as necessary) the home of every notified case is visited at least once a month, often once a week, by a dispensary nurse. This plan is carried out even if the patient is in the sanatorium or in attendance at the dispensary. Any member of the household not in perfect health is advised to see a doctor, and pressure is brought to bear by repeated visits. In such cases the doctor often refers the case to the dispensary.

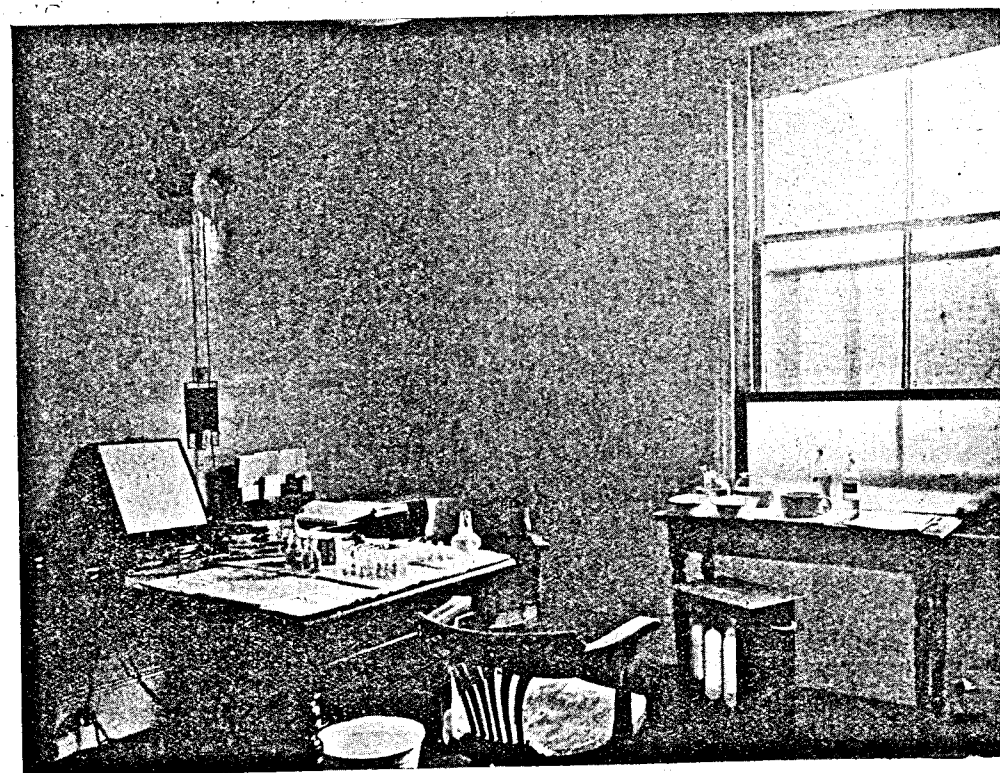
In some cases the patients bring their own contacts for examination, whilst in other cases the medical officer visits the homes to discover them.

(4). *Doubtful Cases.* Medical practitioners often refer doubtful cases to the dispensary for a diagnosis, and if the diagnosis be positive they request the local authority to carry out treatment. A large amount of work is done under this heading.

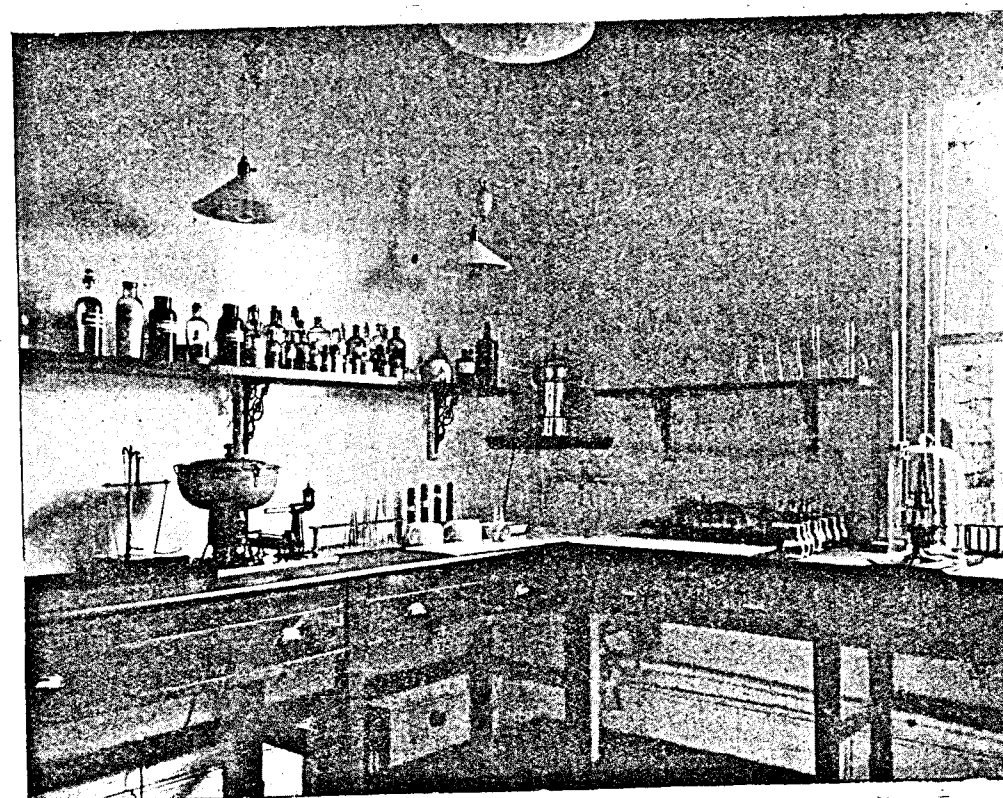
(5). *School Cases.* The school medical officer refers to the dispensary cases which require more detailed examination, one half day each week being set aside for this purpose.

PROCEDURE ADOPTED WHEN A PATIENT COMES TO THE DISPENSARY.

All visits are by appointment, and as far as possible the routine as stated below is followed



THE CONSULTING ROOM. SOUTHAMPTON DISPENSARY.



THE LABORATORY. SOUTHAMPTON DISPENSARY.

in arriving at a diagnosis, prognosis and the line of treatment indicated.

Forty-five minutes are allowed for the first visit. The patient is first interviewed by a nurse, who records the name, address, age, height, weight and such other particulars as she can ascertain. The tuberculosis officer then goes into the history of the case. A careful physical examination is made and all facts are entered on the special form (Form 1). At the end of this examination a Quanti-Von Pirquet test is performed. Before leaving, the patient receives a thermometer and a four-hourly temperature card, and the nurse teaches him how to record and take his temperature. He is given a sputum flask and urine bottle and instructed to visit the dispensary on the following day, bringing with him his temperature record and a specimen of sputum and urine.

On the second day the temperature is recorded on charts specially drawn up for this work; the Von Pirquet papules are measured and recorded and the patient instructed to attend on the following day. After the second visit the urine is examined in the ordinary way and the sputum is examined for tubercle bacilli and albumen.

At the third visit the temperature and the Von Pirquet measurements are again entered up. If necessary, further samples of sputum or urine are asked for or additional Von Pirquet tests performed.

On one of these three visits the patient is X-Rayed and a photograph taken.

The ascertained facts (history, symptoms, signs, including temperature range, Von Pirquet results, X-Ray observations and result of sputum examination) are now carefully weighed. In most cases a diagnosis and prognosis can be made and the form of treatment decided upon.

If the diagnosis be not complete a fourth visit is arranged, when a subcutaneous injection of albumose-free tuberculin is given. In the absence of a sufficiently definite reaction injections are continued, at intervals of several days, of increasing doses of tuberculin, until a positive reaction is reached; if this dose fails to produce a positive reaction and there is no other conclusive proof of tuberculosis the patient is considered to be free from the disease.

When the temperature runs high, or when, after careful instruction, unsatisfactory temperature records are produced, the patient is admitted to the sanatorium for observation; cases presenting unusual difficulty are also admitted.

Patients severely ill do not go through the usual routine at the dispensary above described; if further diagnostic observations are necessary after the first visit they are admitted into the sanatorium. Cases too ill to visit the dispensary are visited at home by the tuberculosis medical officer. For such cases the borough ambulance is provided for removal to the sanatorium.

PROCEDURE WHEN DIAGNOSIS IS COMPLETE.

(1). *Cases sent for treatment.* If the case be latent and not requiring treatment, or non-tubercular, he is referred back to his doctor, to whom the result is communicated. If active tuberculosis be diagnosed one of the after-mentioned forms of treatment is adopted.

(2). *Cases sent by a practitioner for diagnosis.* The patient is referred back to his doctor, who receives the result in a written communication. In a positive case the doctor sends a notification to the medical officer of health under the Tuberculosis Regulations, and very frequently requests the Health Department to undertake any necessary treatment. It is interesting to note here that the doctors often refer better class patients for treatment.

(3). *Contact Cases and School Cases.* Active cases are referred to their doctor, who generally fills up the application form for municipal treatment. Negative or latent cases are asked to come up in three to six months' time so that the diagnosis may be confirmed by further observation. A definite appointment is made and recorded at the dispensary so that the nurse can look the patients up if they fail to attend as arranged. As a rule these patients attend very well indeed.

(4). *Insured Cases.* Form Med. 4 of the Insurance Commissioners recommending the appropriate kind of treatment (sanatorium, dispensary or domiciliary treatment) is filled up and submitted to the local Insurance Committee for its approval.

METHODS OF TREATMENT.

As in diagnosis, the work is done on a definite plan so that the results can be correctly summarised at the end of the year. Experience has shown that with the accommodation available the best results are obtained by dividing the different forms of treatment into the following five classes:—

(1). *Dispensary treatment.* This entirely ambulatory form of treatment is utilised for the following classes of cases:—*

* The Turban-Gerhardt is the anatomical classification adopted.

NAME		No in Ledger		Date of commencing chart		Southampton Municipal Dispensary	
Date	Weight	Date	Weight	Date	Weight	Date	Weight
st	lbs	st	lbs	st	lbs	st	lbs
Weekly Summary	Tuber	Weekly Summary	Tuber	Weekly Summary	Tuber	Weekly Summary	Tuber
97	98	97	98	97	98	97	98
99	100	99	100	99	100	99	100
101	102	101	102	101	102	101	102
103	104	103	104	103	104	103	104
105	106	105	106	105	106	105	106
107	108	107	108	107	108	107	108
109	110	109	110	109	110	109	110
111	112	111	112	111	112	111	112
113	114	113	114	113	114	113	114
115	116	115	116	115	116	115	116
117	118	117	118	117	118	117	118
119	120	119	120	119	120	119	120
121	122	121	122	121	122	121	122
123	124	123	124	123	124	123	124
125	126	125	126	125	126	125	126
127	128	127	128	127	128	127	128
129	130	129	130	129	130	129	130
131	132	131	132	131	132	131	132
133	134	133	134	133	134	133	134
135	136	135	136	135	136	135	136
137	138	137	138	137	138	137	138
139	140	139	140	139	140	139	140
141	142	141	142	141	142	141	142
143	144	143	144	143	144	143	144
145	146	145	146	145	146	145	146
147	148	147	148	147	148	147	148
149	150	149	150	149	150	149	150
151	152	151	152	151	152	151	152
153	154	153	154	153	154	153	154
155	156	155	156	155	156	155	156
157	158	157	158	157	158	157	158
159	160	159	160	159	160	159	160
161	162	161	162	161	162	161	162
163	164	163	164	163	164	163	164
165	166	165	166	165	166	165	166
167	168	167	168	167	168	167	168
169	170	169	170	169	170	169	170
171	172	171	172	171	172	171	172
173	174	173	174	173	174	173	174
175	176	175	176	175	176	175	176
177	178	177	178	177	178	177	178
179	180	179	180	179	180	179	180
181	182	181	182	181	182	181	182
183	184	183	184	183	184	183	184
185	186	185	186	185	186	185	186
187	188	187	188	187	188	187	188
189	190	189	190	189	190	189	190
191	192	191	192	191	192	191	192
193	194	193	194	193	194	193	194
195	196	195	196	195	196	195	196
197	198	197	198	197	198	197	198
199	200	199	200	199	200	199	200

CHART IN USE AT THE SOUTHAMPTON DISPENSARY.

- (a) Non-febrile patients with no sputum, satisfactory home conditions, sufficient nourishment, and who carefully follow advice given on home hygiene etc. A large number of children with glandular tuberculosis come under this heading and attend school on those days when not attending the dispensary.
- (b) Non-febrile patients with sputum and good home conditions, and where the medical officer feels absolutely assured that due care is exercised in the proper collection and disposal of sputum.

Many of these cases are early ones or slowly progressive cases in stage 2. They are often the bread-winners and attend the dispensary in the evening or meal hours.

(2). *Four weeks' sanatorium residence followed by dispensary treatment* for the following classes:

- (a) Non-febrile cases who require hygienic instruction before ambulatory treatment can be successful.
- (b) Patients who cannot be relied upon to exercise care with sputum.
- (c) Cases where difficulty is experienced in commencing a course of tuberculin treatment owing to the unreliability of the temperature records, or the difficulty in controlling the patients and securing adequate rest after injections. Many of these may be classed as observation cases and are often admitted before diagnosis is complete. During their stay in hospital these patients attend lectures and receive daily instruction on hygiene, diet, disposal of sputum and the taking of temperature records. This short interval is usually found quite sufficient for adequate education and, at the same time, allows the course of tuberculin treatment to be more satisfactorily initiated, as the patient is under absolute control and constant observation.

(3) *Two months' sanatorium followed by dispensary treatment*, for the following:

- (a) Fairly well marked cases, often running a temperature, with a good prospect of arrest of disease and return to wage-earning capacity after a combined course of sanatorium and specific treatment, followed by dispensary treatment.
- (b) All febrile cases with good prospects come under this class of treatment.

These patients frequently lose all temperature and gain 14 to 20 lbs. in their two months' sanatorium residence. They are able to leave the sanatorium in much better health and to undergo a successful dispensary course of treatment. Although the patients enter for a definite time, the period may be reduced or increased according to progress made, and in this connection home conditions also influence the decision of the medical officer. After discharge they visit the dispensary for further treatment and frequently return to work before the dispensary course is completed.

This form of treatment is responsible for about 60 per cent. of admissions to sanatorium, and it is to be regretted that these patients do not seek medical advice at an earlier stage when there would be better prospects of practical cure. Again, another regrettable feature is that many practitioners wait for tubercle bacilli to be found before they venture on a diagnosis; this often leads to such a delay in treatment that a practical cure cannot be obtained.

Most of the cases applying for sanatorium benefit under the Insurance Act are in late stage 2, if not in stage 3, and come under this class for treatment; although the disease may be arrested there is invariably more or less permanent impairment of working capacity.

(4) *Two months' educational sanatorium treatment followed by domiciliary treatment* for the following:

- (a) Cases with a very bad prognosis where temporary improvement and relief of troublesome symptoms in the sanatorium can only be hoped for. As these patients may live for months, instruction is given on sputum disinfection and personal hygiene before they return home to end their days. The progress of the case during sanatorium residence may suggest that the period of stay be increased in those cases where more improvement is shown than was at first anticipated and where there may be a possibility of successful tuberculin treatment if the disease becomes less active during the course of sanatorium treatment.
- (5) *Domiciliary treatment* for the following:
- (a) Patients with no prospects, are too ill to benefit by educational treatment, or where such would be useless owing to probable death within a short time. Some of these cases are removed to the

sanatorium for isolation purposes and nursing.

- (b) Hopeless cases in good homes where there is no need for education in a sanatorium.

DETAILS OF DISPENSARY METHODS.

The time table is so arranged that new patients are seen at the beginning of the day, as such a plan conduces to more accurate and careful observations than if the tuberculosis officer were called upon to examine patients in the afternoon after having spent a busy morning treating large numbers.

New patients are seen from 9.30 to 11 a.m. each morning; from 11 to 1 patients under observation are dealt with; Monday, Wednesday and Thursday afternoons and evenings are

It would be out of place in this paper to deal extensively with the method of tuberculin treatment adopted, but it might be briefly stated that treatment at the dispensary is always commenced with P.T.O.; the intensive system is used and with adults the initial dose is usually .002 c.c. Injections are at first given twice weekly. If the reaction gives a temperature above 99.5° Fah. the interval is prolonged to one week or longer, when the last dose is either repeated or a less dose given.

After .5 c.c. is reached the patients attend once weekly until the dose reaches 1 c.c., and a special appointment for careful examination is then made. (This appointment is arranged before 1 c.c. is reached if need be).

If further treatment be required albumose-

TEMPERATURE CHART.

Southampton Municipal Dispensary.

No. 1, EAST PARK TERRACE.

Name

Address

DATE.	8 a.m.	12 noon	4 p.m.	8 p.m.	NEXT VISIT	DATE.	8 a.m.	12 noon	4 p.m.	8 p.m.	NEXT VISIT.
M.						M.					
T						T					
W.						W.					
Th.						Th.					
F						F					
S.						S.					
Sun.						Sun.					
M.						M					
T						T					
W						W					
Th.						Th.					
F						F					
S.						S.					
Sun											

devoted to treatment, and Tuesday and Friday afternoons to laboratory work. Each appointment is previously made, and the patient knows that by attending at the fixed hour there will be no waiting.

The observation hours (11 a.m. to 1 p.m.) may appear to be excessive compared with those for new cases and treatment, but in addition to observation of tuberculin test doses, Von Pirquet results etc., this is the time when the tuberculosis officer takes the opportunity of giving advice on occupation, diet, rest, exercise etc., to the patients who are commencing dispensary attendance, and thus having carefully gone into such details, it is only necessary to ask casual questions and impress certain points after the patient is placed in the list for attending during treatment hours.

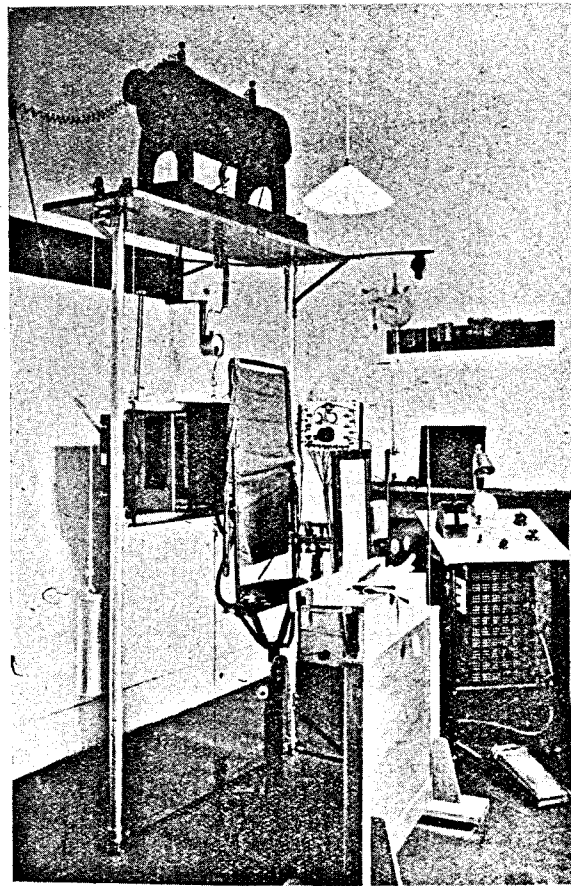
free tuberculin is given with a commencing dose averaging .04 c.c.

The patients take their temperatures at 8 a.m., 12 noon, 4 p.m., and 8 p.m., and record them on a small card, which covers a period of four weeks and allows a small space for each temperature; the card is also provided with spaces in which the doctor enters the date and hour of the next visit.

The records are transferred to our eight weeks' temperature chart by the nurse at each attendance. Each patient is weighed weekly, and the weight recorded in the space provided for this on the temperature chart.

All records relating to one patient are kept in a cardboard file. These files are indexed and special provision is made for their storing.

When X-Ray work was first started here photographs were taken on glass negatives, but these have now been superseded by films specially prepared for the Southampton Dispensary. These are less cumbersome and have the great advantage that they can be filed with the other records of the patient. Paper negatives would have obvious advantages in this respect. Paper negatives have not yet arrived at a state of perfection to justify their use, but the ordinary films act very well indeed, and can be recommended to those engaged on this work.



THE X-RAY ROOM, SOUTHAMPTON DISPENSARY.

In addition to the work already mentioned the dispensary has other important functions. Lectures or informal talks are periodically given in the waiting room. The patients are previously notified of the date and hour and are invited to attend. Sputum bottles and disinfectants are supplied to all notified cases.

During home visiting the nurses supply literature. "Simple Rules on Health" printed on cardboard (18 in. x 12 in.) are given to shopkeepers, who are invited to display these in prominent positions.

Sanatorium.

The rules in operation at the sanatorium in regard to diet, rest, graduated exercises, etc., are much the same as in other sanatoria.

In suitable cases tuberculin treatment is undertaken. P.T.O. is the preparation principally used, but as the patients are under constant observation and control, a wider variety of tuberculin can be tried than is possible at the dispensary.

It cannot be maintained that the usual length of stay is sufficient to effect a cure, and the

dispensary must be relied upon to complete the treatment after the patient's discharge. The period is, however, sufficiently long to ensure a very sound course of instruction being given to each patient. In this sanatorium education is made one of the special features.

Each nurse undertakes a share of the work of instruction and her educational duties are laid down in writing by the tuberculosis officer, and the matron and the resident medical officer see that these are carefully performed.

Too much space would be taken up in detailing the various educational duties but it might be well to refer to a few of the more important.

The sister in charge is responsible for all lectures, a special syllabus being laid down which covers a period of one month. The medical staff give lectures, and from time to time question the patients in order to estimate the effectiveness of the instruction given by the nurses.

On one day each week the first assistant nurse cleanses all the sputum flasks; this operation is witnessed by all patients who are up. On all other occasions during the week the nurse sees that the patients carefully cleanse their own flasks.

A junior nurse is responsible for seeing that every patient washes his teeth before breakfast and after every meal.

The temperatures for the ward charts are taken by the nurses at 2 a.m., 6 a.m., 10 a.m., 2 p.m., 6 p.m., 10 p.m., but at 8 a.m., 12 noon, 4 p.m., and 8 p.m. each patient takes his own temperature, records it on a dispensary temperature chart, shakes down and washes his thermometer. A junior nurse supervises this work. It may seem to some that this routine of taking temperatures by patients over a period of one or two months is unnecessary, but its value is very considerable and worth all the trouble when the patient finally leaves the sanatorium to become a dispensary patient. The patient becomes quite expert with the thermometer and the medical officer at the dispensary is able to rely with absolute confidence on the temperature records provided by ex sanatorium patients.

A rag handkerchief is supplied to each patient daily. The handkerchief is to be used for the nose and not for expectoration, and is destroyed by burning at the end of each day.

Such are a few of the details of the scheme which has been evolved at Southampton, and it will be seen that the authority which receives the notifications of the disease from general practitioners is the one which undertakes dispensary and sanatorium treatment of the residents, whether insured or not, in addition to dealing with methods of prevention, including disinfection, home visiting and the spread of knowledge.

A patient coming under the municipal scheme is received, treated, educated and guided in his future life and work by the one organization; this same organization protects his dependents

and those in contact with him, and is the body which has the power more than any other to influence the social and economic conditions under which he lives.

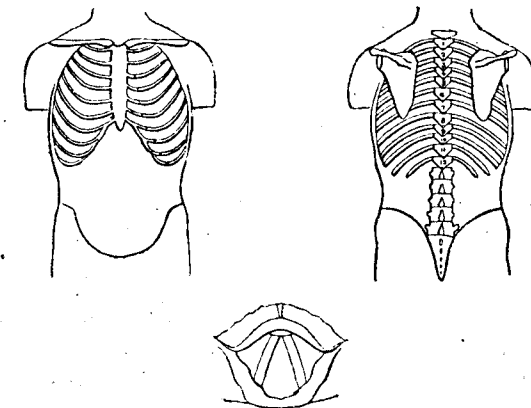
This grouping of all measures for dealing with tuberculosis under one set of officials allows a complete co-ordination of effort and prevents overlapping, and it is difficult to believe that any other scheme which sets up more than one body of workers can work with anything like the same measure of success, economy and harmony.

FORMS REFERRED TO IN PRECEDING PAGES.

FORM 1.

SOUTHAMPTON MUNICIPAL DISPENSARY.

No. in Ledger.....			
Name			
Address			
Age	Sex	Married?	Muscular Development
Height	Present Weight		Max. known Weight
Temperature			
Mouth, Nose and Pharynx			
Cervical Glands			
Chest	Measurement	Expansion	
Sputum Quantity		Tuberculin Von Pirquet	
T.B.	Albumen	Subcutaneous	Local General Focal
Blood	Elastic Tissue		
Diagnosis			
Recommendation			



X Ray Observations:—

Notified by	Date of Notification	Insured
Reason for coming		
Occupation		
Working full time?	If not, why not?	
Family History		

Personal History

History of present affection

Mode of onset

How long ago

Course

Present condition

General

Working Capacity

Night sweats

Signs of wasting

Cough

Expectoration

Dyspnoea

Hæmoptysis

Hoarseness

Anorexia

Indigestion

Diarrhoea

Constipation

Lassitude

Pain

Menstrual Disorder

Circulatory System

Pulse

Abdomen

Urine

Sp. gr.

Reaction

Albumen

Sugar

Date

Signature

FORM 2.

SOUTHAMPTON
MUNICIPAL DISPENSARY.

PROGRESS.

No. in Ledger

Name

DATE

FORM 3.

SOUTHAMPTON
MUNICIPAL DISPENSARY.

Regulations Notified

Doctor

No. in Ledger

Date of Report

19

Name

Age

Address

Married or Single?

Occupation

Has patient changed occupation?

If not working, why?

Able to work full time? - Or part time? Confined to bed?

How long ill?

Number of Rooms occupied?

Number and Ages of Inmates?

General aspect of House (clean, damp, dusty, smelly)?

Number of Windows? Can they open?

Are they kept open (a) by day?

(b) by night?

Does Patient sleep alone (a) in Bed?

(b) in Room?

How is Washing of Clothes done?

How long in present House?

If has moved within two years, previous Addresses?

Have there been Illnesses or Deaths in House?

(a) In own time?

(b) In previous occupancy?

Exposed to infection (a) at home?

(b) at work?

(c) among friends?

Present health of other members of household?

What precaution taken to disinfect?

T. B. in Sputum?

T. B. in dust of room?

General Dietary?

Teetotal?

Proximate income of household? Rent? Stand at?

Assisted by Societies, Church, Friends, Parish, &c.?

Recommendation

REMARKS:

Signed.....Reporter.

.....Medical Officer.

ERECTING FENCE OVER A SEWER.—At the North London Police Court, on January 22nd, Mr. Dingwall, Upper Clapton, was summoned for allowing a fence to remain over a sewer belonging to the London County Council without their consent, contrary to the Metropolis Management Act, 1862, Section 68. It appeared that the boundary fence between two gardens of two houses which belonged to the defendant covered the sewer, and that this fence had been erected over the sewer. The above section makes it an offence to erect *inter alia* a fence over a sewer without the previous consent in writing of the Council in whom the sewer is vested. The County Council were willing to consent subject to the payment of the yearly sum of one shilling, but the defendant refused to take up the consent. The magistrate held that the County Council had power to impose a charge as a condition of giving their consent, and adjourned the case in order that the Council might be informed that in the magistrate's opinion the consent should be given without any condition whatever.

CORRESPONDENCE.

The Editor does not accept responsibility for the opinions of correspondents.

INFANTILE MORTALITY AND THE HEALTH OF SURVIVORS.

To the Editor of PUBLIC HEALTH.

SIR,—The contention that high mortality of infants in any large community is the cause of a lower death-rate and a higher standard of health in the survivors, is necessarily based on the belief that hereditary influences bulk largely in determining the high mortality. Those who hold this view maintain that natural selection in a crude form is still at work in the most civilised races of mankind and that any factors which limit its action are detrimental to the future adult population. Their opponents, of whom, naturally, many are in public health services, are equally convinced that environment is a more potent factor than heredity. Their case is supported by the increased mortality of infants in the seasons when certain preventable diseases are prevalent and in localities where the domestic and financial circumstances are low. On the other hand, it is not denied by the supporters of the *laissez faire* policy that many infant-lives can be saved by devoting an abnormal amount of care to them. What they do deny is that the lives so preserved are of value, or indeed survive the period of childhood in any appreciable number. They hold that a large number of physical undesirables are born into the world in the natural course of things; Nature's remedy is to kill them off and leave room for more valuable lives. Their investigations have been pursued with the greatest statistical skill. It has certainly never been proved that hereditary inability to maintain health is a negligible cause of deaths in infancy. The question to be solved is the extent to which heredity and environment are respectively at play.

It is therefore clear that in any investigations of this problem an effort must be made to eliminate one or other of the two great factors, in order to estimate the importance of the other. Dr. W. Gibson Parker, in a contribution to PUBLIC HEALTH, April, 1913, has published an enquiry of value, in that he has taken every pains to ensure the accuracy of his figures and to discount the personal element in their acquisition. Incidentally he has shown us that it is possible for an enquiring mind to get relief from the rather monotonous routine of school medical inspection. But he concludes that "they" (the results of his investigation) "certainly support the opinion that a high infantile mortality is associated with a deterioration of health among the survivors"; and, from his previous sentence and the motive of his enquiry, we must infer that his results are to apply to the general population. His survivors,

however, and his deceased infants belong to the same groups of families. If heredity has nothing to do with the matter, his deduction is justified; but not till that hypothesis has been proved. A heritage of weakness may very well exhibit itself in death of infants and poor health of adolescents in the same family, where the environment is blameless.

Of more weight is Dr. Parker's discovery that the largest families suffer most, for it suggests an economic common cause. But this may not necessarily be due to such adverse post-natal circumstances as relative poverty and relative neglect of children. For frequent parturition may harmfully affect the mother in such a way as to influence the ovum, before or after fertilisation. This, however, if it were proved to be so, would be in a sense not a hereditary but an antenatal environmental cause of weakness, and might be regarded as preventable. It has also been held, with what justice I do not know, that human beings prone to such diseases as phthisis and insanity—to which it still remains to be proved that there is no hereditary predisposition—have increased procreancy. If parents who are liable to transmit a lower standard of vitality to their offspring partake of this increased sexual virility, large families and bad health may be related rather as results of a common cause, than as cause and effect. Moreover, the size of families may be due to the age of the parents at marriage, a factor which has been held to have some influence upon the vitality of the offspring.

I should be the last to adopt the hypothesis of despair that urges the Spartan method; nor indeed should I admit that public action ought to be controlled by counsel which is based on none but material motives. But if sanitarians go out to meet statisticians with their own weapons, it will be well to have a keen eye to the pitfalls, for their blindness to which statisticians themselves have been so frequently blamed. The results of an investigation of familial tendencies can hardly be applied to the general population, until the factor of heredity is shown to be negligible.

I am, etc.,

RALPH M. F. PICKEN.

VENEREAL DISEASES.—In April, 1911, the Board of Health of New York adopted a resolution expressing the conviction that a comprehensive plan for the control of venereal diseases was necessary for the protection of the public health, and, as the first and most important step, an appropriation was requested for the construction of a hospital for the care of patients suffering from these diseases. The city authorities have since made a sum of \$55,000 available to the Department of Health for this purpose. It is hoped to have this hospital in operation early in 1913.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856. RECONSTRUCTED 1888.
INCORPORATED 1892.

AN ORDINARY MEETING of the Society of Medical Officers of Health was held at the Offices of the Society, No. 1, Upper Montague Street, Russell Square, London, W.C., on Friday, 11th April, 1913, at 5 p.m.

Present: Prof. E. W. Hope (President), in the chair; Sir Shirley Murphy, Drs. T. W. N. Barlow, W. G. Willoughby, F. J. Allan, Ridley Bailey, Charles Porter, R. E. Lauder, Herbert Jones, S. C. Lawrence, E. H. Snell, J. W. Hembrough, C. Sanders, H. C. Pattin, William Butler, A. E. Porter, Alex. Anderson, J. R. Kaye, T. Eustace Hill, Philip Boobyer, P. W. Spaul, W. S. Stalker, A. S. Stalker, C. Rolleston, B. L. T. Barnett, R. A. Dunn, F. Robinson, J. M. Clements, C. S. Brebner, A. B. McMaster, J. J. Paterson, Thos. Strain, J. M. Johnston, W. H. Hamer, J. Tate, E. F. W. Bywater, P. Pattison, A. Ball, J. M. Cowie, Duncan Forbes, A. G. R. Cameron, J. P. Walker, H. A. Hall, Alex. Graham, A. H. Bygott, G. C. Taylor, W. J. Butcher, H. P. Newsholme, J. S. Tew, R. H. Wilshaw, R. J. Ewart, C. F. Stovin, B. C. Stevens, R. W. C. Pierce, F. C. Shrubsall, and Dr. Christina L. Goode, visitor. The Hon. Secretary read a letter from Dr. J. Niven expressing regret at his inability to be present.

Minutes.—The minutes of the previous ordinary meeting, held on March 14th, 1913, and published in PUBLIC HEALTH (April, 1913, p. 211), were taken as read, approved and duly signed by the chairman.

Election of Fellows.—The following candidates, who had been duly nominated, were balloted for, and were declared by the President duly elected:—Stanley Child, M.B., D.P.H., Slinfold, Horsham, Sussex; William Arnott Dickson, M.D., F.R.C.S., Ed., D.P.H., County Buildings, Cupar, Fife; Alexander James Ewing, M.A., M.B., Ch.B., D.P.H., Town Hall, Blackburn; Albert Jones, M.B., Ch.B., D.P.H., Town Hall, Widnes.

Election of President for Session 1913-1914.—Dr. Herbert Jones reported that the Council had nominated Dr. A. K. Chalmers, medical officer of health of Glasgow, as President for the coming session. On previous occasions it had been the custom for the retiring President to ballot for his successor in the name of the Society. The President thereupon reported that he had balloted for Dr. Chalmers, whose election as President for 1913-14 was unanimous.

Election of Honorary Officials for Session 1913-1914.—Dr. Herbert Jones reported that the Council had elected for the ensuing session Sir Shirley F. Murphy, editor; Dr. Charles Sanders, as hon. treasurer; Dr. William Butler, as hon. librarian; Dr. Joseph Priestley and Dr. Herbert Jones, hon. secretaries.

The President moved a vote of thanks to the retiring treasurer, Dr. Reginald Dudfield. Dr. Sanders seconded the motion, which was adopted by acclamation.

A discussion on "The Administration of Sanatorium Benefit" was opened by Dr. P. Boobyer, Dr. Eustace Hill and Dr. Kaye.

On the motion of Dr. Butler, seconded by Dr. Lawrence, the discussion was adjourned to Friday, 25th April, 1913, at 5 p.m.

IMMUNIZATION AGAINST TYPHOID FEVER IN NEW YORK.—Immunization against typhoid fever, or the inoculation of a healthy person with sterilized typhoid cultures, in order to prevent infection with typhoid fever, has passed beyond the experimental stage and has become established as a prophylactic measure of proved efficiency. Practically all authorities now agree that the practice confers a notable immunity against typhoid infection and reduces by three-quarters the number of cases in localities where it is adopted. Under similar conditions typhoid fever occurring in immunized persons is, approximately, only one-half as fatal as in persons not so protected. Typhoid fever thus is less apt to occur, and when it does occur, runs a milder course among the sick who have been immunized than among those who have not.

Feeling that its wider use, under proper precautions, is called for, the Board of Health of the City of New York on December 10, 1912, authorized the performance of immunization against typhoid fever by its inspectors, under conditions similar to those governing the free administration of diphtheria antitoxin. Beginning January 1, 1913, inoculations have been made at the homes of applicants and at the central office of the department, Centre and Walker-streets, Borough of Manhattan. The culture is furnished free to physicians for their own use. All requests for immunization must be made or approved by the attending physician. Requests for inoculation can be made by telephone or letter to the Division of Communicable Diseases of the Department of Health. Immunization is offered to all other members of every family in which a case of typhoid fever occurs.

As at least 10 per cent. of the cases of typhoid fever occurring in New York City are thought to be due to contact, immediate or indirect, with a preceding case in the same locality, and not to infected water or milk, it is hoped that widespread immunization of the members of all such families will sensibly reduce the occurrence of typhoid fever in New York City.

A circular of information regarding immunization against typhoid fever has been issued, and (together with a leaflet of information regarding the new diagnostic clinics for venereal diseases of the Department of Health) has been sent to every physician in New York City. These circulars are supplied to any citizen upon request.

* To be published in a subsequent number of PUBLIC HEALTH.

LAW REPORTS.

KING'S BENCH DIVISION.

December 17th and 18th, 1912.

BEFORE RIDLEY, COLERIDGE AND PHILLIMORE, J.J.

REX v. LOCAL GOVERNMENT BOARD; EX-PARTE ARLIDGE.

Housing and Town-Planning, etc., Act, 1909.—Refusal to determine Closing Order—Appeal to Local Government Board—Persons to determine Appeal—Right of Appellant to be heard in person.

On an appeal to the Local Government Board in respect of a refusal to determine a Closing Order under S. 17 of the Housing, Town-Planning, etc., Act, 1909, it is not necessary that the appeal be heard by the Board itself, or by a member of it, or that the parties be heard in person by the Board. An Order allowing or dismissing the appeal will be valid if it is signed by the President of the Board, and if the procedure provided by the Act and the Rules made thereunder are followed.

On the application of William Arlidge a rule nisi was granted requiring the Local Government Board to show cause why a writ of *certiorari* should not issue to quash an order made by the President and assistant secretary of the Board on February 26th, 1912, dismissing an appeal by the applicant William Arlidge against the refusal of the Hampstead Borough Council to determine an order made by them under S. 17 (2) of the Housing, Town-Planning, etc. Act, 1909, prohibiting the use of the dwelling-house, 83, Palmerston Road, Hampstead, for human habitation. The rule was moved on the ground that the Local Government Board had not determined the appeal in manner provided by law.

The applicant was the lessee of the premises in question, and the Borough Council pursuant to the above Act had made a closing order, and although the applicant had effected certain repairs, the Council had refused to determine the order. The applicant appealed to the Local Government Board in manner provided by the statute. The Board ordered a local inquiry to be held by one of their inspectors, at which the applicant appeared and gave evidence. After this and before giving their decision the applicant was asked if he desired to make any further statement in writing to the Board. The appeal was dismissed by the Board by an Order made under the seal of the Board signed by the President and countersigned by an assistant secretary.

It was not said that the Board had failed to carry out the rules made pursuant to Sect. 39 of the Housing, Town-Planning Act, but it was contended that the procedure adopted by the Board was contrary to natural justice.

The Court discharged the rule.

RIDLEY, J., in the course of his judgment, after referring to the provisions of Sects. 17 and 39 of the Housing, Town-Planning, etc., Act, 1909, and to the rules made under Sect. 39, said that these rules had been complied with. The contention, however, was that the decision was not in accordance with the Act, because no one had been heard by the Board. It was said that this was a judicial matter, and took the place of the former appeal to Quarter Sessions; and that, therefore, the appellant had a right to appear, and be heard before the Board. This did not follow from the natural construction of the Act. There was no provision that the applicant should be heard in person by the Board. Then it was said that the Board had not decided the appeal at all, that the Board consisted of the Secretaries of State and of certain other individuals, and that there was no power for anyone to determine a matter of this kind except the members of the Board or the secretary or assistant-secretary, if authorised by a General Order of the Board, which had not been done. He could not accede to that argument. It must be assumed that some person who has authority to deal with the matter as a member of the Board had so dealt with it.

LORD COLERIDGE, J., said, on the point as to the order not being dealt with by the Board, it must be assumed that this public document was properly made unless the contrary was clearly shown. As to the next point, that after the public inquiry the applicant ought to have been personally heard by the person who ultimately was to decide, the procedure adopted was to obtain evidence in writing, and the Board were justified in pursuing the course which they did.

BANKES, J., in the course of a lengthy judgment, said now there are two grounds upon which it is said that the Local Government Board have not proceeded in manner provided by law. The first ground is that, although the applicant has been given by Sect. 17 (6) of the Housing, Town-Planning, etc., Act, 1909, the right of appeal to the Local Government Board, his appeal has not in fact been determined by the Local Government Board. The second point, as I understand it, is that, even if he is wrong in that contention, the procedure adopted by the Local Government Board in deciding his appeal is contrary to natural justice, because it has not afforded him the opportunity of being heard. Now, in my opinion, both those grounds fail. As to the first point, there being here an order which is properly authenticated by the seal of the Local Government Board and the signature of the President and the signature of an assistant-secretary, in my opinion that is an act of the Local Government Board, and it is quite immaterial who the person was who in fact had the consideration of this matter delegated to him, because for all the

purposes of this statute that order so authenticated must be taken to be the act of the Board.

As to the second point, the right to be heard is provided for by the parties being heard by way of written statement sent directly to the Board and by their attending before the inspector at the local enquiry, and according to the statute these two opportunities are considered sufficient.

I quite understand that this form of procedure may be considered by many persons to be very undesirable, and that it would be far better that these appeals should be heard, as they were previously heard, before a judge, not only in a judicial manner, but before an ordinary judicial tribunal. With that we have nothing to do. If I might make one observation, which I have no right to make, it is that it occurs to me that it would perhaps very much add to the confidence which people feel, if these reports which the inspectors make as the result of these inquiries and as part of the hearing, were not always treated as confidential documents.

[For a full report of this case see 77 J.P., 131.]

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THE AGE FOR COMMENCING SCHOOL

THE age of attendance appears to have been a debatable subject from the time of the earliest school records in the dawn of history, but the topic, however ancient, still deserves discussion. As is pointed out by Dr. Wood in a paper on "The influence of the school medical officer upon school attendance," the question has been asked whether it is justifiable in the interests of the children, of the parents, or of the ratepayers, that one-tenth of the school accommodation should be utilised for children under five. The opinions of educationalists of classic times were definite: the youth of Persia, Sparta, and Crete entirely left the care of their mothers in their seventh year, and thence on till adult life lived in something between a boys' club and a boarding school.

The age of six has on the whole been adopted as the time for commencing school, and many aver that those children who first attend even a year or so later are by no means handicapped as a result of this late start.

In the discussion on Dr. Wood's paper, the very adverse opinion of a Norwegian educationalist was quoted. On the other hand, during the last two years, the education world has been attracted by the accounts of the great work carried on in Italy by the "Children's Houses," and the "Montessori method" has attained to world-wide fame. It all depends on what is meant by school. If education only means the acquisition of more or less facility with the three R's, the commencing age is of little importance.

Appreciation of the meaning of education is shown by the motto of a great foundation, "Manners maketh man." As the twig is bent so the tree will incline, and the behaviour of each generation depends on habits impressed on it in early life. The younger the child the greater the impression, and education of habits and character begins with birth, if not before. Education is an apprenticeship for life, and only the best masters should be chosen. When the home influences are good there is the ideal education to hand; the needful

lessons of kindness, restraint, and order are easily received; where the home influences are bad, the child learns to be querulous, angry, discontented, unclean in body and mind. There is a great difference between the small community with abundant open space and a free and unrestrained home life and the crowded manufacturing town. Hence the opposing answers from Norway and Italy.

The chief argument brought against the attendance of children in numbers at any institution, whether school or crèche, is the risk of the spread of infectious disease. That attendance at school is attended by such risk is an undoubted fact. Where elder children of the same family attend school they may bring infection home to the younger children so that exclusion of the younger children from school only preserves them from this risk when none of the family are school attendants. Even then the protection of the young child is not completely secured, for this is in the main dependent on the orbit or range of activity of the individual child. Hence the question of attendance at school of young children must be determined by a balance of considerations. In their homes the younger children are left largely to themselves exposed to all conditions of wind and weather, and not until an infectious disease is far advanced is its presence recognised and any care taken. If attending a school, whatever its nature, this should have been discovered at once, and the mother put on her guard.

Both for educational and hygienic reasons it should be clear that the younger the children the smaller the number who can be supervised by one person, and that none can be in the sole charge of one person in case of mishaps occurring. Small groups, all coming from neighbouring dwelling-houses, would be the ideal, and no school, or whatever it be called, should consist of more than eighty. A school for each block of dwellings, the plan of the Children's Houses, is one that seems worthy of a very thorough trial both from the educational and the public health standpoints.

THE INFLUENCE OF THE SCHOOL MEDICAL OFFICER UPON SCHOOL ATTENDANCE.*

By A. HAMILTON WOOD, M.D., D.P.H.,
Assistant M.O.H. for the County of Warwickshire.

SINCE the introduction of medical inspection, by the passing of the Education (Administrative Provisions) Act, 1907, our elementary schools have witnessed considerable administrative changes. The advent of the school medical officer, an officer now regarded as having, in the words of the Code, "specific functions in the system of public elementary education," was indeed epoch-making. His influence in the schools, even in this short time, has gone far to improve the hygienic conditions both of schools and scholars, and when we reflect for a moment on the conditions existing in our public elementary schools prior to medical inspection we marvel that such were allowed to exist so long, both education and health suffering for generations as a result of the nation's apathy.

Although his influence in the schools has been exerted in many directions, I propose to deal briefly with only one of these—the influence of the school medical officer upon school attendance.

The first question deserving consideration is the age at which infants are admitted to our elementary schools, and the regulations pertaining to the same. Though the lower age limit of school attendance is an old and well-worn subject, it still merits further discussion, as the problem has not yet been, in my opinion, effectually solved. The age at which attendance is compulsory is five, and according to Article 43 of the Code, "no attendance may be reckoned for a scholar who is under three years of age," so that the period between the ages of three and five is optional as regards attendance at school. It is the attendance of such children that should receive the attention of school medical officers.

Arguments have been brought forward by eminent hygienists in favour of the exclusion from our schools of such tiny babies, admission not being allowed until they had reached the age of five or even six. It is estimated that one-tenth of all the children attending our elementary schools are under five, and Dr. Newsholme, who has written rather extensively on this subject, asks "whether it is justifiable in the interests of the children, of their parents, or of the ratepayers and taxpayers, that

* A paper read before the Midland Branch on March 6th, 1908.

one-tenth of the teaching staff, one-tenth of the expenses of administration, and almost one-tenth of the total school accommodation should be used for children under five years old." I unhesitatingly aver that money thus spent, under present social conditions, is well spent, and my contention is that more still should be spent in the enlargement and better equipment of our infant schools for the reception especially of children from three to five years of age.

It is not with the children of the higher or middle classes we are concerned, but the children of the poor.

Many of these babies are undoubtedly better off in school than in their homes, where they are allowed to crawl about on filth-laden floors, in ill-ventilated and odorous rooms, too often penned indoors while their mothers go a-gossiping with their equally gossipy neighbours, or visit the nearest beer shop for their accustomed morning draught. It is under such degrading conditions that many of our school children are nurtured. Is it not far better for these little ones that they be taken away from such an environment for at least four hours a day, and placed in more hygienic surroundings in the company of other children of a similar age, where their time can be spent in a manner beneficial to them at that tender age?

Sir Thomas Clouston, in advocating a higher age for compulsory school attendance, speaks of the newly-admitted infant thus:—"He has at last made the great transition from the home to the school, from his cradle community to the community of strangers, from the soft nurture of family sentiment to the realities of discipline." Yes; but I fear that many of the homes from which our elementary school children are drawn lack that "soft nurture of family sentiment" referred to by our respected psychologist; and the strain of the infant school, conducted in a proper manner, should be to such children an infinitesimal quantity.

I do not mean to deal at any length in this paper with the pros and cons of the lower age limit for school attendance, but would like to refer for a moment to the question of infectious disease, an argument frequently brought forward in favour of the exclusion of children under five years of age from our infant schools.

It is admitted that school attendance influences the spread of infectious disease by the crowding together of children in school, and that measles and whooping cough are extremely

fatal infectious diseases among children under five. Although over 90 per cent. of deaths from measles occur under five years, it does not follow that children should on that account alone be excluded from school until they have reached five or six years of age. Statistics show us that the fatality of measles between the ages of three and five is very much less than between one and three, and that it decreases very slowly indeed from five to eight. It is most fatal, then, among children under three years of age.

FATALITY OF MEASLES AND WHOOPING COUGH IN ABERDEEN IN 20 YEARS.*

Age.	Fatality—i.e., No. of Deaths per 100 Persons attacked at each age.		Attack-rate per 1,000 of population at each age.	
	Measles.	Whooping Cough.	Measles.	Whooping Cough.
0	13.9	12.5	44	69
1	10.0	10.1	86	74
2	3.4	3.3	86	73
3	1.6	2.2	79	65
4	0.9	1.6	75	54
5	0.7	0.5	86	52
6	0.5	0.7	75	36
7	0.5	0.1	47	19
8	0.4	0.3	21	9

* Wilson, G. N., *Public Health*, Vol. xviii., p. 69.

We have in the notification of suspected infectious disease by head teachers and school attendance officers a useful weapon for the control of infectious disease in our schools, and I hold that the hand of the medical officer of health is really strengthened in this connection by the attendance at school of children from three to five, and by the judicious use of such notification.

By the detection, for example, of cases of measles occurring among these younger children, and their immediate exclusion, steps can be taken to control the spread of infection among the infants, and parents can be warned by leaflets, sent through the head teacher, of the seriousness of the condition and the necessity for care on their part in the prevention of complications and of further infection among other members of the family.

By drawing attention to these points I do not for a moment suggest that the age for compulsory school attendance should be reduced from five to three, but that these younger children, especially in the more thickly populated areas, should be encouraged to attend school rather than discouraged.

There are, of course, instances in which such early attendance would not be recommended;

for example, where children live so far from a school in rural districts that it would be impracticable and injurious to their health to attend.

The regulation at present in force regarding the attendance of children under five is found in Article 53 (c) of the Code, which reads:—

"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."

In many areas, as in Warwickshire, the county in which I work, it is usual for teachers to admit children under five years of age so long as there is sufficient accommodation in the infant department for them. This is the point I wish especially to draw attention to. I hold that there should be accommodation for all who seek admission, and that the babies should in every school be properly catered for.

In some schools in my division of the county attention is paid to the physiological requirements of these tiny infants, in that they have sufficient floor space wherein to join in games, ventilation and lighting sufficient, suitable baby chairs and tables, means for rest when sleep overtakes them (that is, the provision of hammocks or hammock chairs), and above all a teacher specially adapted to the management and proper education of babies of this age. Unfortunately these ideal conditions are rarely to be met with, but instead we too often find the huddling together in the one room of infants of all ages; not infrequently do we find infants sharing a corner of a room which should rightly be used by the older scholars only, possibly the only room available; desks totally unsuited to their requirements; in fact, no attempt is made to look after the interests of these young babies, and yet local education authorities continue to admit them so long as there is accommodation.

If children under five years of age are to be admitted, they should not be allowed admission until the school medical officer is satisfied as to the suitability of the department, from a true hygienic point of view, for their reception. It is through his influence that the regulations relating to this matter will receive further attention and amendment, for which, I am firmly convinced, there is a pressing need.

There is at present considerable controversy over the suggestion that the age at which children should leave school should be increased to fifteen or sixteen years of age, but this does not concern the school medical officer to any

great extent. It is a problem rather for the educationalist or sociologist to determine, and is quite beyond the scope of this paper.

The next matter affecting attendance that I shall deal briefly with is the attendance prize system. It is customary for many local education authorities to encourage regular attendance by offering prizes to those scholars who make upwards of, say 95 per cent. possible attendances during the year. Although such a scheme may have its advantages in stimulating the children to attend regularly and punctually, thereby augmenting the Government grant, it is also an important factor in the spread of infectious disease. One frequently hears of children struggling to sit out a school session, suffering possibly from headache, sore throat, or sickness, even vomiting in school, yet, with a prize in view, they endeavour at all risks to put in an appearance, if only for the sake of an attendance mark.

If such indisposition should result in scarlet fever, diphtheria, or other infectious disease, how easily is it spread to others in the class! The grave danger, too, that the child is running is too frequently ignored altogether by the over-anxious parent.

The possibility of an attendance prize is occasionally found to be a cause of delay in obtaining treatment, especially hospital treatment, for defective vision, as recommended at medical inspection, the journey to hospital being put off till the summer vacation, too often resulting in no treatment at all.

If the system is to be adhered to it is only fair to the child that absence on the recommendation of the medical inspector, or absence on account of illness, should be allowed for, but better still would it be if the system were abolished altogether.

I have spoken of absence from school as a result of infectious disease, but attendance is affected very seriously by illness other than infectious. Many children are, without doubt, kept away on account of trifling ailments, while others may be seriously ill, and yet the parents are unable through poverty to seek medical aid. In such cases there is no evidence forthcoming as to the cause or possible duration of absence from school, and these the school medical officer is called upon to investigate.

In boroughs this is a comparatively easy matter, the attendance officer summoning the absentees to appear at a centre for examination; but in county areas there is experienced

considerable difficulty in carrying this out, and without a large staff is well-nigh impracticable.

Attendance would no doubt be greatly improved were the school medical officer to work in close touch with the attendance officer, and inquire into every absentee whether in possession of a medical certificate or not. Were this adopted, I rather fear the work would grow enormously, as parents would defer seeking medical advice from their family doctor, expecting a consultation free and gratis from the school medical officer or his representative.

As the average staff at present available in the school medical service is quite inadequate for the co-operation between attendance officer and school medical officer to the extent I have just suggested, we must still look to the general practitioner for help in this direction.

This question leads me now to touch upon the rather delicate subject of exclusion certificates granted by general practitioners.

Although at the commencement of medical inspection there may have been a little feeling of resentment on the part of the general practitioner to the incursion by the school medical officer into his domains, I think that feeling is rapidly vanishing, and in my district at least, and I believe it is now general, a much better understanding exists between the two services. There is still, however, an occasional difficulty with reference to exclusion certificates.

The duty of attendance officers is to see that children of school age attend school regularly, and if not in attendance to ascertain the reason for their absence. It is to aid in the latter that the services of the school medical officer are called upon, and it is in this connection that conflict may arise with the general practitioner.

That certificates for non-attendance at school are issued rather too freely by some members of the profession must be, I am sure, the experience of most school medical officers, and I think some measures should be taken by such officers, either through the British Medical Association or through some other channel, to bring home to those practitioners concerned the desirability for the exercise of greater caution in the certification of school children.

At present we are placed in the undesirable position of buffer between the school attendance officer and the practitioner. An absentee is brought to us for examination, and we certify as to the child's fitness to attend, but it not infrequently happens that immediately

pressure is brought to bear upon the parent by being summoned in the first instance before the Local School Attendance Committee or school managers, a certificate is promptly forthcoming that the child is unfit to attend school. I find that by far the majority of these troublesome cases concern children near the leaving age, when parents are anxious for them to leave school and commence work.

On the production of such a certificate I have heard of managers remarking, "Let the doctors fight it out between themselves!" the parent meanwhile being dismissed without so much as a caution. In such an eventuality the only course to be adopted which appears to me at all practical, if we wish to defend ourselves, is to call upon the practitioner concerned and discuss the case with him.

In country districts this entails considerable delay, adding to the child's absence from school, besides being occasionally a none too pleasant task. But if practitioners would only appreciate the difficult situation thus created, they would, I feel sure, if approached in a reasonable manner, help us in this matter by exercising greater care in the certification of school children, especially near the leaving age. Wily parents, through exaggeration or imagination of subjective symptoms, are frequently accountable for this state of affairs, as it is not to their interests to inform their family doctor of a previous examination by the school medical officer, in the hopes that he will, by his certificate, refute that officer's testimony.

There is one other group of children whose attendance at school deserves some consideration, and with whom the school medical officer must concern himself. I refer to those not naturally robust, who are pale and undernourished, whose capacity for intellectual work is in consequence lowered, who may have come from tubercle-infected homes, who may themselves be actually suffering from early pulmonary tuberculosis without signs sufficient to attract attention, or who may be suffering from the effects of chorea or rheumatism, such children, I say, require special consideration by the school medical officer with regard to their attendance at school. If children of well-to-do parents are at all run-down, or are suffering from any of the conditions just mentioned, they are at once taken away from school and sent into the country or to some suitable seaside resort, where, with proper care and attention, they regain, in course of time,

their lost bodily and mental vigour, and are able once more to hold their own with their more robust and fortunate companions.

Not so with our elementary school children. Weakened by disease, or by insufficient feeding, they struggle on, endeavouring to keep pace in their education with their class mates, to result in a gradual failure in health or in the onset of a serious illness, and if excluded from school are oftentimes worse off at home with parents who cannot appreciate that their health is endangered, or, if they do, are quite unable to help them to regain their strength. Such children fall an easy prey to tuberculosis, maybe not while attending school, but during the period of adolescence, when the strain of work proves too great for them, and it is for these that some scheme should be organised, not only in connection with our town schools but with our country schools also, whereby the health of weakly children could be recuperated and the attendant evils guarded against.

In connection with our town schools we have, or may have, such institutions as open-air schools, sanatorium schools, and residential schools of recovery, but in country areas little provision, if any, has been made for the class of child I am at present referring to.

Those country children actually suffering from consumption, notified pulmonary tuberculosis, will no doubt be catered for, but we must go a step farther back, and deal effectually with the suspects and the physically weak. The organisation of a system of convalescent or recovery homes is, I think, the most practical solution of this question; homes to which the school medical officer could draft selected cases for residence for varying periods according to particular needs. So long as Government grant is based on attendance it should be only fair for attendance at such convalescent homes to be counted towards the total number of attendances reckoned for grant, so that there need be no complaints from the attendance department on that score, the school medical officer having a perfectly free hand to send cases to these homes for as long as he deems necessary for the purpose of recovery. The necessary medical attention for such homes could be given by the school medical inspector, including the diagnosis by tuberculin, of the tuberculous children, the administration of all being supervised by the school medical officer.

Although such an undertaking would at first sight appear prohibitive, it must always be borne in mind that it is the welfare of the

future race we are striving after in all the big medico-educational schemes that have been evolved during the last few years, and this cannot be attained without, as we all appreciate too well, great pecuniary sacrifice from the present generation.

Though attendance generally may have suffered since the advent of the school medical officer, through the exclusion by him of children suffering from infective skin disease, verminous heads, and the like, and also through time spent in attending hospitals both as out-patients and in-patients, in the remedying of defects found at medical inspection, it will all make for better attendance in the near future, when there should be fewer defects to remedy, when the cleanliness of school children, as is evidenced even now in the schools of Warwickshire, has reached a distinctly higher standard than in the pre-medical inspection days, and when the child has received from his earliest entry into school that medical supervision which should stand him in good stead when he has to go out into the world and face the ever-increasing competition that lies before him.

DISCUSSION.

THE PRESIDENT thanked Dr. Wood for bringing forward this interesting subject. He had always taken great interest in the question of school attendance, and was strongly of the opinion that children should not attend school until the age of five. Under present conditions he thought that the bulk of the children between the ages of three and five were better anywhere than at school. In regard to infectious diseases, his own experience was that with measles and whooping cough most of those attacked were below five years old.

DR. MANLEY thought, in regard to the age of school attendance, that, unless we had the ideal surroundings suggested by Dr. Wood, school attendance should not be insisted on in the case of infants below the age of five. The question of finance was of great importance, and he thought that education authorities would hesitate to spend much money in providing accommodation for infants between three and five. He deplored the formation of a service of medical inspectors who had had no experience in general practice. He thought that this was one reason for friction with general practitioners. Unless the school medical service understood from experience the difficulties under which general practice was carried on, a certain lack of sympathy would result. Great tact was necessary in dealing with practitioners. With attendance officers he found that without regulations he had been able to get fully into touch, and he found that the school attendance officer was practically under his direction. By

giving this officer an interest in his work—which was very monotonous—he found that this officer became a very valuable official. Lastly, he referred to the great pride which a school medical officer could undoubtedly take in the work he was able to accomplish, which he thought was more easily recognisable than that possible in general public health work.

DR. AUDEN referred to school attendance as one of the most important and difficult problems with which we had to deal. He related their experience in Birmingham in regard to the arrangement they had come to some eighteen months ago with the British Medical Association; under that arrangement in cases of prolonged illness a report or certificate was asked for from the doctor in attendance; last year he dealt with over 2,000 such certificates, which came directly to him. On the whole he found that the amount of labour involved was out of proportion to the result obtained. With regard to the attendance of children under five, he questioned whether schools were ideal places for such children to spend their time in; he was in favour of the French system of crèches under supervision. He failed to see how teachers were especially capable of looking after infants, and his views were different from those of Dr. Wood on the matter. Teachers were not usually trained in the matter of looking after babies. Outside of England no civilized nation made attendance compulsory under the age of six. In Norway he once discussed this matter with a Norwegian educationalist, who said: "You English do some silly things, but this seems the silliest thing that I have ever heard of." Dr. Auden criticised the furniture of schools for infants. And he spoke of hop-picking as a very valuable hygienic outing for two weeks for school children. In regard to the unification of the school attendance service with that of the medical service, he thought that the solution would be found in insisting on a Royal Sanitary Institute certificate or in making the attendance officers health visitors. He referred to the great waste of money in large towns involved by the army of attendance officers employed under the present system.

DR. BOSTOCK HILL differed from Dr. Wood on the subject of infants' attendance; he did not believe in sending such infants to school and placing them under teachers. Doubtless they were sometimes taken from undesirable surroundings, but they were often put into an environment equally undesirable. He did not agree with Dr. Auden in the amalgamation of the school attendance officer and the health visitor; the former often had to adopt measures of a coercive character, and these were not suitable powers to place in the hands of health visitors. In regard to the prize system, he thought this pernicious, in that it was an inducement for children to attend

school from homes where infectious disease existed. He did not agree with Dr. Manley's dictum in regard to the absolute necessity of a school medical inspector having had a great previous experience in general practice; he thought that years spent in gaining this experience would be largely a waste of time if they were merely preparatory to taking up a school appointment.

DR. HAMILTON WOOD briefly replied on some of the points raised.

APPOINTMENTS.

DR. WM. ANGUS has been appointed assistant medical officer of health for the City of Leeds.

DR. J. J. BUCHAN has been appointed medical officer of health for Bradford.

DR. W. L. BURGESS has been appointed chief tuberculosis officer for the City of Dundee.

DR. A. G. CALDWELL has been appointed one of the assistant tuberculosis officers for the County of Durham.

DR. A. G. R. CAMERON has been appointed assistant and deputy county medical officer of health of Durham.

DR. A. A. GROSVENOR has been appointed medical officer of health of Stevenage U.D.

DR. T. SHADICK HIGGINS, of Birmingham, has been appointed medical officer of health of St. Pancras.

DR. ERNEST HILL, formerly health officer for the Colony of Natal, has been appointed medical officer of health for the municipality of East London, South Africa.

DR. C. W. HUTT, M.A., M.D., D.P.H., has been appointed senior school doctor of the County Borough of Brighton.

DR. G. W. N. JOSEPH has been appointed medical officer of health for Warrington.

DR. D. F. MACRAE has been appointed one of the assistant tuberculosis officers for the County of Durham.

DR. G. J. M. MARTIN has been appointed assistant school medical officer of Portsmouth.

DR. W. G. M. MUNROE, of Maidenhead, has been appointed consulting tuberculosis medical officer for the County of Middlesex.

DR. E. D. PARSONS has been appointed assistant tuberculosis officer for Northampton.

DR. N. C. PATRICK, of Glenavy, has been appointed tuberculosis officer for the County of Antrim.

DR. A. B. RAFFLE has been appointed school medical officer under the Durham County Education Authority.

DR. R. D. SNEEDLEY has been appointed county medical officer of health of West Sussex.

DR. D. M. TAYLOR, school medical officer at Halifax, has been appointed resident medical officer at the Sanatorium for Consumptives, about to be established by the Corporation at Shelf.

DR. D. T. TORRENS has been reappointed medical officer of health to the Market Rasen U.D.C.

DR. ENID WALTERS has been appointed school medical officer for Bromley.

DR. A. C. WATKIN, of the Brompton Hospital for Consumption, has been appointed tuberculosis medical officer to the Salop County Council.

DR. ADAM WHITE has been appointed tuberculosis medical officer for Herefordshire.

DR. C. L. WILLIAMSON has been appointed one of the assistant tuberculosis officers for the County of Durham.

DR. L. A. M. WILSON has been appointed assistant medical officer by the Edinburgh School Board.

DR. W. T. WOOD, of Creswell, has been appointed medical officer to the Blyth and Cuckney R.D.C.

DR. WM. YEATES, of Neville's Cross, Durham, has been appointed by the Tynemouth Town Council clinical tuberculosis officer and assistant medical officer of health.

REPORTING OF VENEREAL DISEASES.

THE Department of Health has undertaken an extensive study of the venereal diseases in New York City and is desirous of obtaining as full information as possible as to the prevalence of these diseases. By virtue of the resolution of the Board of Health of the City of New York, dated February 20, 1912, the superintendents of all public institutions have been required since May 1, 1912, to report promptly all cases of syphilis, chancroid or gonorrhoeal infection coming under observation. All physicians were requested to furnish similar information concerning their private patients (omitting name and address), but no attempt was made at that time to reach every physician in the city.

Cases reported by private physicians will be filed by case number, which will be given the physician for future identification, when his report is acknowledged.

A supply of report cards to be used for this purpose will be forwarded on request. All information is regarded as absolutely confidential and is not accessible to the public nor are the records deemed public records.

The Department of Health makes, without charge, the Wassermann test for the diagnosis of syphilis, and also provides facilities for the free bacteriological examination of discharges for the diagnosis of gonorrhoeal infections.

Outfits, with full directions for obtaining specimens, can be had free at any of the department supply stations, a list of which will be mailed on application.

A diagnosis clinic for venereal diseases is held daily between 9 and 10 a.m. at the central office of the Department of Health at Centre and Walker-streets, where patients may be referred by physicians for the performance of the Wassermann re-action and for examination of fresh specimens for the presence of treponema. *No patients are examined unless referred by physicians (excepting those who have no physicians), and under no circumstances are the results of examinations reported to the patients.* A similar clinic is held at 307 West 33rd-street on Wednesday evenings, between 8 and 9 p.m., for the benefit of applicants unable to attend during the day.

FOOD AND CONTAGIOUS DISEASES.—Dr. H. R. Buritt, the school medical officer of Newport, Mon., reports that a boy suffering from ringworm, who was too busy to attend the clinic for treatment, was employed in the delivery of bread, and that two brothers suffering from contagious skin disease were engaged in supplying pastry to the public.

CHARA FÆTIDA AS A WATER POLLUTER.

AND AN ACCOUNT OF A TRIAL WITH COPPER SULPHATE TO OBIVIATE ITS EFFECTS.

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

IN a paper read before the Society of Medical Officers of Health and published in PUBLIC HEALTH nearly 20 years ago upon the "Contamination of Drinking Water by Natural Means," I called attention to the pollution of water by chara and certain other water plants, and since then I have had further experience in this matter, the general tendency of which has been to prove that natural vegetable growths in water, and their products constitute a most important source of chemical pollution, by increasing those oxidizable, nitrogenous, and carbonaceous compounds whose presence is usually taken as evidence of dangerous pollution upon discovery by chemical analysis, and, as a secondary or consequent result, by increasing the bacterial and other microscopic flora.

Chara fœtida (C. communis) growing in stagnant or semi-stagnant waters such as reservoirs of limited size, pollutes in this manner the water in which it grows, giving the water an odour and flavour, which are objectionable and lead to complaint on the part of consumers. One of the sources of water supply at Cheltenham is so affected, and the same trouble has been experienced in several places elsewhere in England.

In the Botanical Order Characeæ there are two closely allied genera, chara and nitella, and species of both are widely distributed, and may commonly be found in ponds and collections of water in various parts of this country. The species chara fœtida is the most objectionable on account of the strong flavour and odour developed in all parts of the plant at all stages of its growth. If taken in hand the plant will be found to have a rough or crisp feel at any time of the year, and held to the nose the odour will be found to be such as to readily suggest its ability to impregnate the water in which the plant grows. If at the end of a dry summer a reservoir be cleansed of it, the large heaps, many tons in weight, that are then removed, acquire in the place where they are deposited, a very penetrating odour indeed. Naturally as the growth dies down at the beginning of winter and begins again in the spring, the tendency is for the pollution to increase as the year advances, the worst effect

being in late autumn when the plant is beginning to decay, and about that time a good many other organisms may be found associated with it. In its growth the plant is wholly submerged, and normally some foot or two below the surface at least, and often at a much greater depth, e.g., at the bottom of a reservoir 20 feet deep. When dry, the plant is extremely friable and can be rubbed to powder in the palm of the hand.

In form and structure this plant is very simple, consisting of an irregularly branching stem. The branches, often outgrowing the primary axis, are pushed out in all directions and interlace, causing the plant to grow in matted clumps or masses. Such mats of growth rise up from the wall of a reservoir to a height of some eighteen inches, and the lateral interlacing branches may be traced in the mat to a similar length. At longer or shorter intervals upon the stem or branch are whorls of acicular leaves. The whole plant is built up of very large tubular cells, which being placed side to side give a striated appearance to stem and branches. The organs of reproduction may be seen together in the early part of summer. The male organ is of the colour and shape of a minute orange, is sessile, and placed at the base of the branch or leaf at its proximal side. About June the plant may be seen to be specked with these minute bright orange globes, just easily visible to the naked eye. The female organ is lemon shaped, dark in colour, spirally marked, and in its unripe state it has a shell of considerable strength, and contains a white pithy substance, destined to develop into spores. It is also sessile and placed at the base of the distal side, that is, in the proper axil of the leaf or branch. Late in the summer the male organ has disappeared, whilst the female persists intact or in remnant. The colour of the plant varies from yellowish to glaucous green, and to drab when dying down in the late autumn and in winter.

A small globular organism resembling volvox has sometimes been found swarming through the water in the autumn, and it has been suggested that this organism represents the spores of the chara. Their number varies much in different years—in the year previous the water in the same reservoir was swarmed with them, but this year none were observed.

In waters containing carbonate of lime the whole plant becomes more or less thickly covered with a glistening deposit upon its external surface that resembles starch or gum

in appearance. This adds considerably to the substance and weight of the plant. It consists of calcium carbonate, and so pronounced is this power of chara fœtida for removing lime from the water, that wherever there is a free growth of the plant the hardness of the water is thereby appreciably diminished. The layer of calcium carbonate is easily dissolved with effervescence by dipping the plant into dilute hydrochloric or other acid, when the structure of the much thinned stem and branches may be more easily viewed by the microscope.

The habit of growth of this plant varies considerably according to the kind of water in which it grows. I was formerly in error in supposing that a water of considerable hardness or of some special quality, like that derived from the Cotswold oolite, was necessary for its development. This does not appear to be the case. The sturdiness of growth, weight and colour of the plant, and the number and size of its whorls of leaves and its general appearance, seem to vary according to its habitat, which is very wide. I have learned this since I had the advantage of consulting the giant herbarium of my friend Mr. Charles Bailey, M.Sc., F.L.S. This great botanical collector possesses an assortment of about forty dried specimens of chara fœtida gathered from as many sources, over a very wide range in the British Isles, from Ireland to Norfolk, and from Cornwall to Scotland.

Last autumn I had an opportunity of trying the experiment of adding copper sulphate to some water affected with chara fœtida, and the result may not be without interest to medical officers of health. The water was contained in a brick built reservoir and had a volume of about 10,000,000 gallons. It had acquired a decided odour and flavour of chara, and, having led to complaint upon being served, it had been cut off from the supply to the town.

The water collected at the situation of this reservoir is derived from springs at the base of the oolite at its junction with the lias clay. Being very pure in its native condition, it receives no treatment for its purification. There are two brick reservoirs, each capable of holding 14,000,000 gallons, situated close together, and every year the water is more or less contaminated by the chara fœtida that grows upon their bottoms and sides, a considerable volume of water having had to be occasionally turned to waste as being unfit for drinking.

The crystalline copper sulphate was added to the water in the proportion of one part per million, one hundred pounds of the crystals being dissolved in the 10,000,000 gallons of water.

The solution was effected with fair and equal thoroughness by reducing the crystals of sulphate to rough powder, placing them in double bags, which were suspended from a boat at various alternate depths, and pulling the boat from side to side of the reservoir by a rope attached to the boat and handled by men stationed on opposite sides of the reservoir. When all the copper sulphate had been thus dissolved, copper could be detected in all parts of the water and at all depths. This solution of the copper involved about twelve hours' labour. Towing the boat with the cord was infinitely easier and more certain of performance than rowing it, which latter mode was first attempted.

No apparent precipitate or additional turbidity was caused in the water by the treatment, nor any alteration of its appearance to ordinary observation. The reservoir was estimated to contain about 70 large trout. Four of these were taken out dead a few days after the copper sulphate was added.

The copper was placed in the water on October 4th. The reservoir was inspected on October 5th, 7th, 9th, 11th, 15th, 23rd, 29th, and December 10th, with reports from the caretaker on intervening dates.

At the time immediately prior to the addition of the copper the water in the reservoir was less clear than that in the fellow reservoir that had been emptied and cleaned of its weed the autumn previous, and as the two reservoirs are only a few yards apart, a comparison of the water in the one with that in the other was easily made. The water treated had a decided flavour and a little smell, which were both absent from the second reservoir.

During the whole of October no difference appreciable to the senses resulted in the condition of the water treated. The degree of clearness was neither more nor less. The flavour was as strong on the 29th as before treatment. During this time the water remained at the same depth, about 17 feet in the middle of the reservoir, as there was neither inflow nor outflow. A sample of water taken about the centre place of the reservoir, i.e., at a depth of 9 feet at about the middle of the surface area, yielded indications of copper to suitable tests during the whole of this time,

the quantity appearing to be about the same, and a similar result was obtained with samples taken from other parts of the reservoir.

On December 10th, sixty-six days after addition of the copper, it was found that the springs had latterly yielded much water, and an addition of fresh water had been permitted to the reservoir under treatment, which now measured an additional two feet of depth. This may have meant an increase of water equivalent to one-fifth of the former contents of the reservoir. Though the appearance of the water was similar, the taste occasioned by the chara was distinctly less evident. A sample taken again from the middle of the water also showed under test that the copper had disappeared, or very nearly disappeared. I was not at all satisfied, however, with the supposition that the copper had been effective in removing the flavour, so far as it was removed, even at this late date, but was inclined to credit the improvement to the lapse of time, the advance of the winter season putting an end to the growth of the plant, the addition of the fresh water, and the aëration and commotion caused by its inflow.

Descriptions of results from addition of copper sulphate to water to rid it of living organic matter and its products have generally indicated, I believe, a first thickening of the water, as by coagulation of solid content, which subsiding to the bottom has left the water clear. In the case under description the spoiling of the water was not caused by the presence of a floating organism, but by a flavour and slight odour, caused by dissolved products, and the water when viewed in small bulk, as in a bottle, appeared clear from the first. The quick precipitation of the copper would seem to require organic matter in suspension for it to combine with, and where this is not present, the copper in such extremely dilute solution might be expected to be a long time disappearing.

In regard to the prevention of the disagreeable conditions, we have clear evidence here that light is essential to the growth of the weed, as in a vaulted underground reservoir receiving the same water no weed grows. It would, however, be a very costly project to cover the open reservoirs, as their area is too considerable. No doubt the flavour and odour could be removed by one of several filtration processes, as by filtering through polarite, or by the addition of chlorinated lime, or sulphate of alumina, followed by passage through a rapidly

acting mechanical filter, but the expense, labour, and loss of pressure head are serious items in our instance, and the pity is that a water of such original great purity should become self-polluted in this manner.

As to the effect upon the chara itself, the weed was not immediately killed. On Jan. 1st I directed the attendant at the reservoirs to dredge me some up from the reservoir that had been treated, and he brought me some which was shrunken and buff coloured according to its winter habit, but evidently alive. It appears, however, that he dredged for some time before being successful in obtaining any weed. It was decided to empty the reservoir, and clean it of its deposit; and during the three weeks from the middle of March this was accomplished, so that by the end of the first week in April the reservoir was empty. The condition was different to that observed in cleaning these reservoirs on former occasions. There was no harvest of weed to remove as such, none standing up in virile growth. The mud at the bottom showed on its surface the remains of branches and leaves of chara that had fallen down and disintegrated. There were some root-like fibres in the mud, but none in active growth, and the deposit was swept down and removed as mud, which, microscopically examined, consisted in chief part of immature diatoms, with next to nothing suggestive of chara. Only in one corner of the reservoir was anything discernible in the mud in the nature of distinct stem and branches of this water-weed, and even there there was little in which life was not extinct.

In the companion reservoir, where no copper had been added, the chara at this time could be seen through the clear water in flourishing growth on the submerged brick bottom and sides, and had this reservoir been emptied a crop consisting of a good many cartloads of weed might have been removed.

It appears, therefore, that the copper did in the end kill the weed in great measure. But dead weed, and copper impregnated mud, having been removed and the reservoir washed "clean," I anticipate the conditions will be as before, and that a new growth of the weed will occur when the reservoir is again filled with water. It will be interesting to see how quickly this takes place.

A few fish skeletons were seen in the mud, perhaps five or six; 53 living trout of a size of 1lb. to 3lb. were removed alive and in fair condition.

THE LATE DR. HERBERT MANLEY.

THE somewhat sudden death of Dr. Herbert Manley, medical officer of health of West Bromwich, after a long illness, notwithstanding his remarkable apparent recovery, which it was hoped would prove to be permanent, has deprived the service of an able officer whose untiring efforts in the cause of public health are well known, not only to his colleagues in the Midlands but to the service generally.

On leaving Winchester School Manley went to Cambridge, where he graduated, afterwards continuing his medical studies at Guy's. He then joined his father in general practice in West Bromwich and succeeded him as part-time medical officer of health of that borough in 1890, having two years previously taken the D.P.H. of the Joint Board. Very soon he showed his capacity as a health officer, and his

might have damped the energy of a man of less strength of character and determination, but Manley did not lose heart; he was too zealous and disinterested a worker in the cause to allow personal disappointment to interfere with duty, he tenaciously held on, always keeping his ideals in front of him and allowing nothing to weaken his energies. The service has benefited by Manley's courageous adherence to duty under somewhat adverse circumstances, and it is a consolation to know that his desires were ultimately, to a considerable extent, achieved through his having added to his appointment of medical officer of health that of school medical officer, thus enabling him to give up general practice, which was not congenial to him, and devote his whole time to public health work. At one time, when a few years ago he was called to the Bar, it would appear that he



THE LATE HERBERT MANLEY, M.A., B.C., M.D., D.P.H.

high reputation was recognised beyond his strictly local sphere. In 1891 he was appointed Secretary of the Midland Branch of the Society of Medical Officers of Health, retaining that office—with the exception of one year when he occupied the chair as President of the Branch—for ten years. He thus, as a member of the Central Council, became more intimately associated with the leaders of the parent Society, with the result that his capacity became known at headquarters and led to his being appointed one of the two honorary secretaries of the Society, a position which he held for three years, 1896–99.

Circumstances unfortunately compelled Manley to retain an appointment which was only a part-time one and did not afford adequate scope for one possessing his administrative ability, and ultimately, when he was in a position to have accepted a higher post, he only narrowly lost several opportunities of securing one. This

contemplated changing his profession from medicine to law, but the whole-time public health appointment came in time to prevent that change. It is a sad fact that so soon afterwards the illness began which for nearly three years either wholly or partly incapacitated him from work and in the end proved fatal.

Apart from his undoubted professional ability, Manley was no mean scholar. He was familiar with several languages, and his last leisure moments immediately before the sudden appearance of grave symptoms were occupied in reading a Greek play. Socially he had many friends, few if any enemies, and his friendship was of a sort that will live long in the memory of all who had the good fortune to know him intimately.

Dr. Manley leaves a widow and two sons, one of whom hopes to qualify as an engineer in a month or two, and the other, who is the younger, is studying farming in Canada.

X-Ray results.

Shadows at root of both lungs.	
Right and left equally ...	14
Right lung more than left ...	3
Left lung more than right ...	6
Shadow at root of right lung only	3
Shadow at root of left lung only...	3

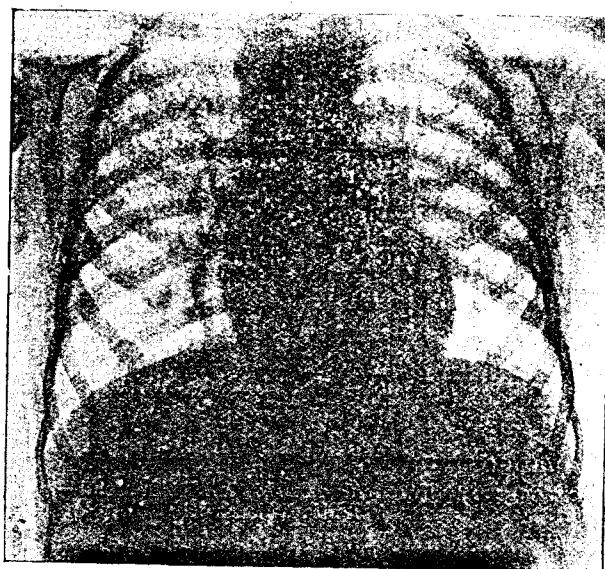
These shadows we found so constantly in this class of child that it might be argued that they were not pathological. I have had many opportunities of examining children of the same ages, apparently in good health, who did not react positive to Von Pirquet, such cases sent to hospital for surgical treatment as hernia, etc., and these shadows have not been present.

It seems certain that the X-Ray appearances above described are produced by disease in

- (2) Fibrous thickening around the glands.
- (3) Healed tuberculous foci in that part of the lung near the glands.
- (4) Active tuberculous disease in the same situation as 3.

The differences in the shadows are doubtless, due to the varying conditions which may be present. We cannot, at present, say positively from the appearance on the screen what stage of disease that particular appearance indicates.

Dr. A. C. Jordan, writing in the *British Medical Journal*, August 31st, 1912, p. 484, maintains that in a large majority of cases pulmonary tuberculosis commences at the roots of the lungs, and spreads to the apices along the bronchi. He supports his conclusion by comparing results of examination of the



3.—BROMPTON CASE. MARKED SHADOW AT ROOTS AND SOME DISEASE SPREADING TO APEX.

the region of the bronchial glands, and it seems reasonable to assume that that disease is tubercular, inasmuch as first these shadows were found in children who reacted positive to Von Pirquet, some of whom had signs commonly associated with pulmonary tuberculosis in the chest, and in whom there were general symptoms, and these shadows were not found in cases in whom there were not symptoms nor signs, and who reacted negative to Von Pirquet.

It is extremely difficult to name the exact condition present in any given case, for, indeed, the shadows may be caused by any one or more of the following conditions.

- (1) Enlargement of the bronchial glands—with or without calcification.

lungs after death with X-Ray shadows produced by those lungs.

There is much discussion as to whether this view is correct, and there does not seem to be enough evidence to support it.

On the other hand the enlargement of the glands may be caused by and be secondary to small lesions in the lungs too small to be recognised or to give rise to physical signs.

I have noticed in several cases that there are physical signs, such as slight crepitations, occasionally heard if the chest is examined at intervals; at other times these have completely disappeared.

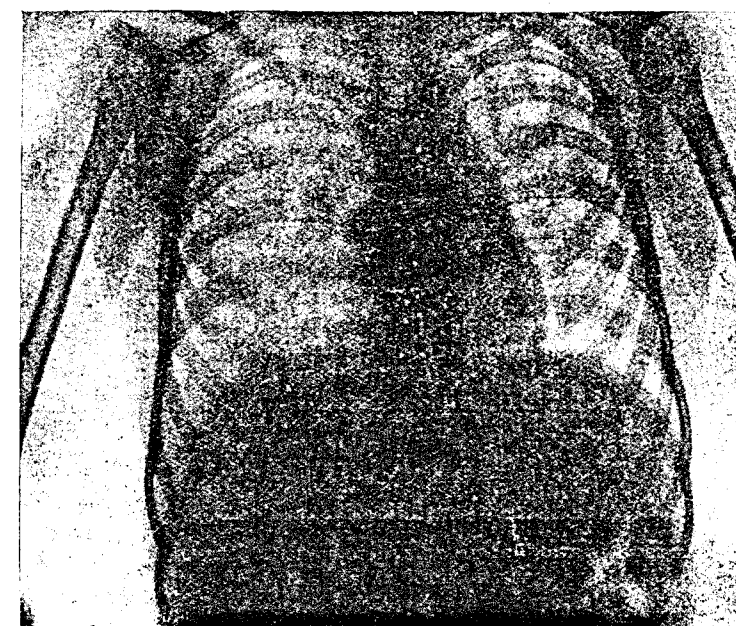
The recognition of these X-Ray appearances as pathological and not physiological is of the utmost importance. If the shadows are found,

when there are no physical signs, by the ordinary methods of percussion, auscultation, etc., in the lungs, the case is in an early stage, when treatment may reasonably be expected to be more beneficial, than if left till the disease is further advanced, and has caused such pulmonary involvement as to be recognised by physical signs in the chest.

The diagnosis of early pulmonary tuberculosis in children is always difficult—physical signs are frequently absent; sputum is difficult to obtain. The X-Rays have helped us; it is difficult to say whether the lung or only the glands are affected, but the presence of a shadow indicates tuberculosis of one or both.

Sanatorium at Littlehampton, and East Cliff House, Margate, cases of pulmonary tuberculosis being taken at Carshalton and Littlehampton, where they have schools for the children, East Cliff House being used for surgical tuberculosis. But these are for Poor Law children, and there are difficulties in the way very often of sending children of fairly well-to-do parents attending elementary schools to Poor Law Institutions.

However, what is next best, open-air schools are provided by the London County Council and their numbers are being added to. Children spend the whole day in these schools from 9.30 to 6, meals being provided.



4. BROMPTON CASE. DISEASE OF LUNG WITH SHADOWS AT ROOT AND SOME DISEASE AT RIGHT BASE.

It is unnecessary to make a definite statement which is involved, because the treatment is the same.

These children, if left in their slum homes with poor food and worse accommodation, will almost certainly develop pulmonary tuberculosis.

The treatment is a prolonged stay in the open air of the country with good food.

To provide this ideal treatment is difficult: in London the Metropolitan Asylums Board have three institutions for children—Queen Mary's Hospital at Carshalton (at which tubercular children are received), the Millfield

Much benefit is to be derived from sleeping out in the open-air, and therefore residential sanatorium schools, as recommended in the chief medical officer's report of the Board of Education, under the constant supervision of a medical superintendent, preferably resident, is the ideal treatment. The children should do a certain amount of supervised physical work as well as organised games, cricket, football, etc.

The temperature should always be taken, and the work and games regulated by the rise caused in individual cases. Absolute rest after meals and after exercise, should be insisted upon.

but the great majority appear to be in more or less regular employment, and casual labour is not largely represented among them.

It generally pays, then, to house Class I. in block dwellings of sufficient size, with good modern arrangements, and in a neighbourhood where there is a demand for this class of dwelling. It is a different matter, however, in respect of Class II.; and it is extremely doubtful if any kind of housing scheme which deals more or less exclusively with this class can be made self-supporting. Industrial dwelling companies cannot look at Class II.; municipalities are very loth to make any provision of this character; and only in certain instances, and under special circumstances, as in Liverpool, has any attempt been made to house the casual labourer. It may, indeed, be argued that where commercial enterprise fails it is the duty of municipal effort to provide the means; on the other hand, the rates are not intended to be provided for purposes of charity; and nothing is more likely to render housing schemes unpopular than that the rates should be permanently burdened to provide improved dwellings for a certain section of the population below the poverty line, but of whom only a small proportion can be directly benefited. The charitable trusts devoted to housing purposes might direct some of their energies in this direction; but, on the whole, it appears certain that the casual labourer class is not one that can be readily benefited by any sort of improved housing conditions. Life in block dwellings does not run smoothly, unless the tenants generally are prepared to obey the rules and regulations made largely for their own convenience and comfort; unless they are cleanly and tidy in their own homes, civil to their neighbours, and capable of developing a certain pride in the orderliness and good character of the dwellings. Now these, unfortunately, are characteristics which the rough and unskilled are often wanting in; and until their social evolution is further developed the communal life of the block dwellings is unadapted to their needs and outlook on life.

THE HEALTHINESS OF BLOCK DWELLINGS.

As is now well known, the sanitary and health conditions prevailing in most block dwellings in towns are good. In dwellings of modern type, occupied by what may be described as a section of the working-class population, the vital statistics are usually excellent, and show that the people, who have regular incomes and are above the poverty line, can live the

healthiest kind of lives. In buildings of older type and occupied by persons who have lower or less regular wages, the mortality rates are higher, but are decidedly lower than those prevailing amongst people of very similar grade who live in the tenement houses of the mean streets, often called the "slums." These facts are set out in the tables, which show the birth-rates, death-rates, infantile mortality rates and death-rates from infectious diseases and diarrhoea, and tuberculosis, in Sir Thomas More Buildings (erected 1904) (pop. 1911, 767), in Guinness Buildings, Chelsea (erected 1893) (pop. 1911, 908), which are inhabited by a lower grade of working-class people, and in four streets in West Chelsea (pop. 1911, 2,173), inhabited by tenement-house dwellers earning low wages, and who are for the most part casual workers. The figures in the tables are the averages of the past eight years, 1905-1912.

Death-rates in Block Dwellings and in Tenement Houses (averages of 8 years, 1905-12).

	Birth-rate.	Death-rate.	Deaths under one to 1,000 Births.	Zy-motic Death-rate.	Tuber-culosis Death-rate.
Sir Thomas More Buildings (Pop. 767) ..	33.3	10.4	69	1.0	1.5
Guinness Buildings (Pop. 908) ..	28.2	17.3	112	2.3	2.5
Area of Tenement Houses (Pop. 2,173) ..	37.9	24.4	164	4.1	3.7

There are two matters in respect of which block dwellings are rather unsatisfactory, and they are (1) the loftiness of the blocks, many of the tenants, especially the older ones, and the women with families, complaining of the numbers of stairs they have to surmount in order to reach their tenements. It is evidently impossible to supply lifts with attendants for each staircase; and automatic lifts would not only seriously increase the prime cost of construction, but would also probably prove dangerous with so many children about. (2) The second point is playing-grounds for the children. It is found in practice that the courtyards and approach roads of the dwellings cannot be used as playing-grounds for the children, firstly, because of the noise, which disturbs the tenants, especially those who sleep during the daytime; and it is surprising what a number of policemen and men employed on night duty inhabit this class of dwelling. Again, if games are permitted, there are certain to be windows broken, and it is usually impossible to detect the actual offender.

One of the great needs of large towns is the provision of playgrounds for the children out of school hours and during holidays. The better health of the children, the greater quietude and orderliness of the streets, and the lessened risk of street accidents would seem to justify the expenditure of municipal funds to obtain such undoubted blessings. As it is, it happens too

tenement, the maximum number of persons allowed, and the cubic capacity per head (two children under 10 years counting as one person over 10 years). The rooms are 8ft. 6in. in height. Each tenement is self-contained—that is to say, each has its own W.C. on an open balcony, and combined scullery and laundry, in addition to the day and bedrooms:—

		Day Room.		Bedroom.		Bedroom.		Occupants.	Cub. Cap. per head.
		S. Area.	C. Cap.	S. Area.	C. Cap.	S. Area.	C. Cap.		
1-Room Tenements		176	1,496	—	—	—	—	2	748
A. 2-Room Tenements		192	1,632	122	1,037	—	—	3½	762
B. 2-Room Tenements		177	1,504	123	1,045	—	—	3½	728
3-Room Tenements		216	1,836	128	1,088	106	901	5	765

frequently that the children of the more respectable working classes, not being allowed to play in the streets or in the courtyards of the dwellings, spend far too much of their time indoors, and suffer in health from want of fresh air. It has been noted, as a fact, in some of the London elementary schools, that the children of respectable, well-paid working-class parents often presented a more fragile appearance, with more marked anæmia, than the children of the lower grade of parents, who allow their children to play in the streets at all hours.

THE TYPE OF BUILDING AND THE ACCOMMODATION TO BE PROVIDED.

1. *The Accommodation.*—The proportions of one-room, two-room, three-room, and four-room tenements must be determined by what is supposed to be the likely demand in the neighbourhood where the dwellings are to be erected. In Chelsea, the Sir Thomas More Buildings provide accommodation in the following proportions: viz., one-room tenements, 15 per cent. of total; two-room tenements, 50 per cent.; three-room tenements, 35 per cent. There are no four-room tenements. During the eight years the buildings have been open there has practically been no loss of rent from "empties," so that it would appear that the buildings meet a popular want. At Grove Buildings, erected in 1910 for people whose earnings are less than 25s. per week, only two-room tenements (66.6 per cent.) and one-room tenements (33.3 per cent.) have been provided.

The above table shows for the Sir Thomas More Buildings the superficial areas of the living and bedrooms in the different classes of

The rules as to the number of occupants permitted in each class of tenement are strictly adhered to, and the taking in of lodgers is under no circumstances permitted. In Grove Buildings the superficial area of the living-rooms is 170ft., and of the bedrooms 130ft., the rooms being 8ft. 6in. high. The numbers allowed to occupy are the same as in Sir Thomas More Buildings.

2. *Self-contained or Associated Tenements.*—There can be no question that self-contained are preferable to associated tenements. For cheap dwellings erected for the lowest class of wage-earners, where the proportion of one-room tenements is large, or where only one and two-room tenements are provided, the self-contained type of tenement may prove too expensive, as the number of sanitary fittings will be very large in proportion to number of rooms. But for dwellings of the type of Sir Thomas More Buildings in Chelsea self-contained tenements are practically now a necessity. The people who become tenants of these blocks are now educated up to this type of dwelling, and will not be satisfied with anything less. For homeliness, privacy, and comfort the self-contained tenement is greatly preferable to the associated.

In some of the later types of self-contained dwellings the laundry-scullery has been also made into a kitchen, a cooking-range being fitted here instead of in the sitting-room, which is provided with an ordinary room-grate. There are many advantages in this arrangement, which is decidedly popular with tenants of the better class; but it is unsuitable for those of a lower grade, who will use a kitchen for any and every purpose, and who still retain

this very large necessity. As Dr. Parkes pointed out, the artisan who can afford to rent more than four rooms could generally shift for himself; it was for those who could not afford to do that that the necessity arose for accommodation being provided by municipalities or charitable trusts. The references to the difficulties in the way of building such dwellings in the suburbs were very important. It was the experience of every centre of population that the workpeople must be housed near their work; and the poorer they were the greater was the necessity, the poorer they were the less rent they could pay, and the less rent they could pay the more expensive must be the site on which they were housed. There was, therefore, a chain of difficulties in trying to remove people of that class into the suburbs. These difficulties were not bounded altogether by financial necessities. These people had lived their lives near their work, they had established their churches, chapels, and schools there, not to mention shops suited to their needs, and they did not want to be shifted away; and if an attempt were made to do so, opposition came from those who helped to provide these necessary schools, chapels, shops, and so forth. Again, it was not unknown to some of them that even political exigences stepped in. The politician said, "Why should so many hundreds or thousands of my supporters be moved away into another district?" while the district into which it was designed to take them looked at the question from exactly an opposite point of view, and said, "We don't want that class of people here, we will do everything we can to prevent it."

The upshot was that there was a necessity for building dwellings for the poorest and lowest-paid class of labourers near to their work, and near to the community they were accustomed to live with. He thought the Chelsea Corporation were to be congratulated in getting the land so cheaply as they had done for the erection of the Sir Thomas More block buildings. It worked out at 30s. a yard, which was not at all out of the way; but still it was a heavy price to pay for the accommodation of people who could only afford to pay so modest a rent. One necessity had been dwelt upon by the reader of the paper—consideration for the children. In Liverpool they had been compelled to provide working-class dwellings in densely-populated localities. He had brought plans of some buildings which had been erected in Liverpool, with which, notwithstanding the cost of the land, a very large margin of playground had been left to the children, and which members could inspect for themselves. He entirely concurred with what Dr. Parkes had said as to the general arrangement of the dwellings; but he would like some information on the question of baths. He was pleased to see that in the later type of self-contained

block dwellings a bath was now provided in each scullery-kitchen. He would also like to know whether hot water was provided. The poorer the class of people, the greater the necessity for hot water. Their families were unusually large, and the inhabitants of those dwellings in Chelsea must be congratulated upon their fecundity which bade fair to go some distance in redeeming the locality from the reproach of a low birth-rate. All that, however, meant a greater burden on the parents. Poverty-stricken parents required all the relief that could be given them in providing facilities for sanitation, and therefore he had always advocated that these dwellings, whatever their rentals might be, should be provided with baths and hot water, the latter preferably from a central system, so that a hot bath could be obtained whenever wanted, without the other tenements suffering from a lack of it. He had been much struck with Dr. Parkes' reference to the importance of a really capable resident superintendent. That was an absolute necessity; a really good class of man was required for a job of that sort. He himself had suggested, but he was sorry to say so far without its being realised, that whoever was appointed should qualify himself as a sanitary inspector, or undergo some training which would enable him to understand the reason why sanitary measures must be adopted. If a man did not appreciate these himself, it would be difficult for him to make other people appreciate them. In Liverpool they had to house the lowest class of the population and at a very considerable cost to the rates; but the results, he was satisfied, good as they were, would be very much better when they would appoint no caretaker of these dwellings except a man who had some sanitary training, and was familiar with the subject of sanitation. Dr. Parkes' paper was, to his mind, extremely valuable and interesting, and was sure to give rise to a profitable discussion. (Applause.) The President added, before sitting down, that Mr. C. S. Joseph, architect, who had collaborated with Dr. Parkes, might make an explanation of some of the plans which he had brought for their inspection.

Mr. C. S. JOSEPH said that Dr. Parkes' paper had dealt so fully with the housing of the working classes in block dwellings that there was very little for him to add. There were, however, one or two points which occurred to him as an architect that possibly would be of interest to the members of the Society. As to the question of cottages against block dwellings, he found from actual experience that the average number of cottages to the acre, after allowing for roads, would be 24; and if these cottages contained two flats it would mean only that 48 families per acre could be comfortably housed, whereas, with block

dwellings over 100 families could be accommodated. In his opinion, housing in block dwellings would continue to be a necessity, not only for the reasons mentioned by Dr. Parkes, but also on account of the hours that the ordinary artisan worked. In London he had to be at his work at 6.30 in the morning, and if he lived in the suburbs it meant that he had to get up very early indeed. There were also many trades where the men did not leave off work until 8 o'clock in the evening; and it was obviously an advantage to be able to live near one's work instead of having to make a long run into the suburbs. The Trusts could not cope with the shifting class, because it was no use housing a man in Chelsea who had to seek work at the docks. On the next point which he wished to refer, viz., the healthiness of block dwellings, there might be a serious difference of opinion. He believed it was generally considered that back-to-back tenements were unhealthy. That opinion originated in consequence of a report made 30 years ago by Dr. Smith, Medical Officer of Health to the Local Government Board, accompanied by statistics showing a terrible death-rate in back-to-back tenements.

There were therefore two classes of people to provide for. The 30,000 tenements which his firm had erected in various block dwellings were full, and had a very large waiting list. The loss of rent was negligible. The few occasional empties there were was caused by people having to move from one part of London to another for the sake of their work, and by the little delay in re-doing up the tenements, so that real empties were practically nil, while in the Guinness Trust the loss amounted to 1 per cent. With regard to housing casual labour; it was obviously impossible to cater for these people, because even a charity like the Guinness Trust or the Sutton Trust, must have some return on the capital invested; and unless the rents came in regularly it would be necessary to charge higher rents to those who do pay in order to make up for those who do not.

When his firm started erecting block dwellings a large number were built back-to-back, and from the statistics of some of these he found that the death-rate was just as low as those with the so-called through ventilation. The reason why Dr. Smith's figures were so terrible was that he took his cases from the lowest class of slum property, where the houses nearly touched one another without any yards at the rear, and no proper sanitary conveniences, while the class of people living in them was of the lowest type. In the Guinness Trust buildings, which were nearly all back-to-back, it was found that the death-rate, including deaths in hospital, varied from 6 per 1,000 to a maximum of 16.97 in some buildings in Brandon Street. There was this peculiarity

about these statistics, that apparently it was the district that made the difference, and not the building at all. Curiously enough, the same remark applied to the birth-rate, which varied from 20.5 per 1,000 in Hammersmith to 47 per 1,000 in Brandon Street. In order to get absolute through ventilation to every tenement, it was only possible to build two tenements to a staircase instead of four, and the cost of this was prohibitive, as it meant that the cost of the staircase (say about £400) was spread over two tenements instead of four. (Mr. Joseph here exhibited the plan which his firm adopted and explained it). As to the height of buildings, unless land could be obtained at a very cheap rate it was necessary to build the dwellings five storeys high in order to make them self-supporting. The reason for this was obvious, as the cost of the foundations, roofs, drains, and paving was exactly the same for a high building as a low one. He quite agreed with Dr. Parkes that self-contained tenements were now more or less a necessity, and that from every point of view they were better than an associated type. His firm never put up associated tenements unless they were to be let for a very poor class of wage-earners. From recent experiments made by him he found that the self-contained type could be let for only sixpence per week more than an associated type. In the Guinness Trust tenements the average wage in each family was 19s. per week, and the rents, roughly speaking, were only half of those of any of the Chelsea block-dwellings. The Guinness Trust was the only one which really catered for the poorest class of wage-earners. There was another type of building which had been adopted by the London County Council and by the City of Liverpool, which had one very serious defect; and that was the balcony plan. A great disadvantage of this type was that in order to get to your tenement you must pass by somebody else's, and that the windows could not be opened. He himself had always set his face against that type.

As to open spaces between buildings, he quite agreed with Dr. Parkes that these should be open at both ends; but the doctor rather under-estimated the width which should be provided between the blocks. His own opinion was that the width of the space should be not less than the height of the blocks themselves; whereas the doctor suggested two-thirds. What was wanted was plenty of air in these spaces, and plenty of room for the children to play. As a matter of fact, in his latest blocks the open space was 40 feet, whereas the height of the top storey was only 37 feet.

From a financial point of view one very important feature not mentioned by Dr. Parkes was the question of rating. Practically all the Borough Councils co-operated with the housing companies or trusts by giving a compounding allowance of

from 15 to 20 per cent. on the rating to the owners, who paid the rates in one sum instead of giving the council the trouble of collecting from each tenant separately, which always meant a loss of rates owing to removals and the difficulty of obtaining money in dribs and drabs. One important exception to this was the Borough of Islington, where the Lewis Trust built their first block of dwellings. This council refused to give any compounding allowance whatever; and the result had been to increase the rents, as the nett return required by the trustees had to be maintained; and owing to the council's action, which he considered a very short-sighted policy, he had decided not to build further in that borough. In some of the boroughs he had had a great deal of trouble with the officials in connection with vexatious bye-laws. The cost of building had risen in London recently as much as 15 per cent., and every restriction put upon the architect meant additional cost which might mean that the buildings could not be erected to pay 3 per cent. It was absolutely necessary, therefore, to consider every little point of construction in detail, in order to keep down the cost, and for this reason it was imperative for the architect not to be hampered by various restrictions imposed upon him by surveyors and medical officers of health in dealing with matters which came under their jurisdiction. As to baths, all the Lewis and Sutton Trust Buildings had baths supplied from their own range. It was quite impossible to have a central system of hot water supply, because it was too costly. Such a central system might require 30 or 40 miles of pipes, several boilers, and a number of attendants, which made the cost absolutely prohibitive. In the dwellings they had erected for the L. and N.W. Railway there were baths in every tenement.

Dr. CHARLES PORTER said that it was always the lobby which gave rise to difficulty in block dwellings and the chief trouble was rather with light than with air. He knew of several old blocks in his own district in which the individual tenements opened off passages so dark that it was impossible almost to find the doors giving access to them. In one particularly bad instance the block was constructed in the form of a Maltese cross, and in several of the tenements the bedrooms were so situated that the windows opened on to the cross portion. In them there was no direct light or air and the rooms were always stuffy. Action with regard to them was being taken under the Housing, Town-Planning, etc., Act, but it was difficult to obtain any real improvement. Mr. Joseph had referred to difficulties experienced with officials. He would like to point out that, as unfortunately medical officers of health had practically no concern with new buildings, most of the trouble must be with some other officer, probably the surveyor. He wished that in the

past some pressure had been brought to bear on the Government to ensure that the medical officer of health should have more power, as most of those present probably knew, in the Town-Planning Act. The only reference to the medical officer of health in relation to new houses was in connection with the granting of certificates when tenements back-to-back were to be constructed in blocks of flats. Those planning blocks of flats he often noticed did not give sufficient attention to the design and shape of bedrooms. They were often too small and very badly shaped, and when a bed was introduced the space allowed for it practically compelled the occupant to lie with his feet or his head up the chimney or outside the door.

PROFESSOR H. R. KENWOOD said that whenever Dr. Parkes had anything to contribute he was always interesting and instructive. Those accustomed to analyse district mortality rates would bear out Mr. Joseph's remarks as to the differences which might occur in different areas of a district. The rate of mortality may vary even in two streets very similar in character and quite near to each other. The truth was that while environment played an important part in the rate of mortality, the habits of the people counted for an enormous amount more. In comparing the mean mortality rates in certain poor streets in Stoke Newington he had been able to account for the differences mainly by the difference in the habits of the people. In the streets occupied by foreign Jews, for instance, he found that the infant mortality was much less than in similar streets occupied by English families of the same class. Dr. Parkes had pointed out the great difficulty, on account of the cost of land, of providing in connection with block dwellings an adequate and suitable playground for children. Personally he would advocate some suitable space for the children as an imperative necessity, physically and educationally, in connection with such dwellings; play is extremely important to a child and he would insist on a better arrangement for the playground than a hard pavement. One difficulty he had experienced in Stoke Newington in connection with block dwellings was with reference to the storage and adequate removal of household refuse. He thought that, in summer time especially, provision should be made for the removal of all domestic refuse from such dwellings at least three times a week.

SIR SHIRLEY MURPHY asked if Mr. Joseph had any experience of common lodging-houses for women of a superior class, and whether they had been a financial success? He said that, as the result of his own inquiries, he thought there was not much prospect they would be financially successful. He was not in agreement with Mr. Joseph in his opinion with respect to through ventilation, but he was heartily in agreement with

him regarding the height of buildings for dwellings in relation to the space about them. In connection with the question of through ventilation, it had been his invariable experience for many years that if he went into back-to-back houses in the morning he found them stuffy to a degree not observable in block dwellings with through ventilation; and therefore he was prepared to be guided in that respect by his nose. He was sure, if it could be managed, that the height of these houses should be limited, and he would always urge the provision of open spaces in the proportion mentioned by Mr. Joseph.

MR. C. S. JOSEPH said that the house to which Sir Shirley referred had only been open a month or so, and the result was not such as had been anticipated. They could not get women into such lodging houses and to remain there. In this particular house, the first night they had two governesses, two domestic servants, and one laundry girl. Unfortunately they were all put on the same floor, and the governesses went off the next morning, the laundry girl got a job and went away to it, and then the two domestics left. (Laughter.)

DR. HERBERT JONES said he had made enquiry into the question of back-to-back houses when he was in practice in Yorkshire many years ago. It was very difficult indeed to get districts which were comparable one with another, but he was fortunate enough to find two districts with groups of dwellings containing, one from 700 to 800, and the other 600 tenements. These were built at the same period, of the same material; they had the same accommodation, were let at the same rent, were on a site at the same height above the sea level, and were occupied by the same class of people. In every respect they were identical, except that one, Saltaire, consisted of through houses, and the other, at Shipley, consisted of back-to-back houses. He took out the statistics of the two groups of dwellings for a period of six years, and found that the death-rate was much higher in the back-to-back than it was in the through houses, although in the case of phthisis there was very little difference in the two groups. It was very difficult to get accurate figures as to population because of empty houses. But at Saltaire the houses were never unoccupied, for every one who worked at the Saltaire Mills had to live in a Saltaire house. The same applied to the 600 houses at Shipley which were back-to-back. Trade was very good at that time, and he knew that none of these 600 houses were empty. He had taken a census of both sets of houses and his figures had been controverted by some people in Yorkshire who were very keen on the question of building back-to-back houses, and who said that his estimate of population of Saltaire was wrong. Oddly enough the proprietors of the Saltaire

Mill had themselves taken a census which agreed with his, so that he considered his investigations were not open to the objection to which others might be. They ought to lay to heart very closely that part of Dr. Parkes' paper in which he laid stress on the importance of the appointment of good administrators in the block houses. Some of them remembered Miss Octavia Hill and her association with industrial dwellings. It was her good administration which was at the bottom of the success of these dwellings.

DR. PARKES, in replying on the discussion, said that his experience was that the social conditions and habits of the people had more to do with the death rate than the environment. He had some very good houses in his district inhabited by a low class of people. These houses were well built, well drained, and in very good sanitary condition; but the habits of the people were so bad that they contributed largely to the rate of mortality. In many designs of dwellings that he had seen, the darkness of interiors was due to balconies. They had never in his district found any difficulty with regard to the disposal of refuse. Each tenement was provided with a small pail, which had to be taken down daily and emptied into a large galvanized iron bin in the courtyard; but he thought it would be better to have these bins emptied three times a week instead of twice. It had been said that a block dwelling scheme was not complete without a playground, but there was an enormous difficulty connected with that. A playground for a block of dwellings containing 800 people, of which from 150 to 200 were children, to be of any use, would require to be a quarter of an acre in extent. The difficulty of getting a quarter of an acre of land was apparent, when the value of the ground was from 3s. up to 10s. per superficial foot. They were all very much indebted to Mr. Joseph for coming there and giving members the benefit of his great experience with municipal and trust buildings; and he had himself been indebted to that gentleman for his valuable help in the preparation of his paper.

THE PRESIDENT said that although it was not the practice of the Society to propose a vote of thanks to one of their own members, they were always ready to extend that courtesy to distinguished guests. He therefore moved a most cordial vote of thanks to Mr. Joseph for his most interesting contribution to the discussion.

AN ENGLISH-SPEAKING CONFERENCE ON INFANT MORTALITY will be held at the Caxton Hall, Westminster, on August 4th and 6th, when the President, the Rt. Hon. John Burns, will preside at the opening meeting. The following are the Chairmen of Sessions:—Her Excellency the Countess of Aberdeen, the Rt. Hon. Joseph Pease, President of the Board of Education, Dr. Arthur Newsholme, C.B., M.D., and Sir George Newman, M.D.

STUDIES IN SMALLPOX AND VACCINATION.*

DR. HANNA, who is assistant medical officer of health of the Port of Liverpool, has found material for his studies in that City and its Port, which are exceptionally exposed to risk of invasion by smallpox owing to the position which Liverpool occupies "as a shipping centre, and the great tide of alien traffic which flows through it." In the work of which he is the author he points out that in the interval after a great epidemic, material will gradually accumulate in the shape of large numbers of susceptible children in districts where primary vaccination has not been carried out with strictness, and that just before an epidemic a large proportion of children in some large towns may be unprotected by vaccination. Addition is made to this susceptible population of those who have escaped the epidemic owing to good vaccination and who lose some of this immunity as years pass and so provide suitable material for the next outbreak, when the virulence of the disease may succeed in breaking down a comparative insusceptibility. These are practically Dr. Hanna's own words, and they tell very clearly the story of what is now taking place in England. He correctly summarises the position by the statement that "The liability of a population to a smallpox epidemic therefore may be measured by its density at susceptible ages."

Liverpool suffered from smallpox in 1902-3, at a time when other communities in England were being attacked, and in that period there were in the City of Liverpool 2,280 cases, with 161 deaths. These have provided Dr. Hanna with subject matter for discussion. In Part I. of his book he classifies 1,163 cases of smallpox, with special reference to vaccination in modifying the disease, and finds that among 943 cases vaccinated in infancy the deaths were 2.9 per cent., and among 220 unvaccinated cases the deaths were 27.2 per cent. In charts illustrating the proportions among cases of smallpox at the several ages which were mild, moderate, severe, and fatal, it is seen that among those vaccinated in infancy the severe cases increase in proportion as age progresses, the deaths not occurring until the age of 20 years is reached. In the chart giving the particulars for unvaccinated persons the maximum proportion of deaths occur among those under two years of age, and the proportion then decreases until the age period 10-15 is reached, after which it increases. The decrease is attributed by Dr. Hanna to the gradual development of the natural resistance and recuperative power of youth, and he states that

both the decrease and subsequent increase is comparable with what was observed in pre-vaccination days. In subsequent papers Dr. Hanna discusses the influence of vaccination in modifying the eruptions, and referring to vaccination after the date of infection, or even after the onset, he mentions that it has the effect of hastening the maturation and desiccation of the pustules.

Interesting observations were made by Dr. Hanna on the relation between the scar-area of vaccination in infancy and the character of the eruption and intensity of subsequent smallpox. These he found to be generally in inverse relation, but he points out the occurrence of a gradual increase in the scar-area until 20-30 years is reached, and, following on this, a gradual decline in the size of this area as years advance. He examined the scar-areas of 368 persons who never had had smallpox and found that they increased until 20-30 years of age, and then declined. This he attributes to "stretching of the scar tissues on growth of the body, reaching its height at the period 20-30 years, and as age advances this scar cicatric begins gradually to atrophy and fades."

Under "Observations on the Interaction of Concurrent Variola and Vaccinia," Dr. Hanna discusses the behaviour of vaccination when this is done at various periods of incubation of and after onset of smallpox. When the vaccination was done during the period of incubation it went through a normal course. This was not the case when the vaccination was done after the onset of the smallpox. There were considerable modifications of the vesicles and in those vaccinated late in the disease no reaction appeared at the site, or simply a slight traumatic action occurred. The vaccination, however, appeared to cause the appearance of a crop of variolous vesicles in its neighbourhood in the same way that smallpox vesicles often appears on parts usually exposed to irritation. Coalescence of smallpox vesicles and pustules around the area of the vaccination may therefore have an appearance of vaccination vesicles and be mistaken for such.

In a section on the "Influence of Concurrent Vaccination on the Course of the Disease," Dr. Hanna states that in respect of cases without a previous primary vaccination, of five cases vaccinated within the first three days of exposure to infection two developed no symptoms of the disease, while three had a very mild attack. "Tracing the cases further on in the disease, we find that the type becomes more or less severe, according to individual susceptibility, until we come to those of moderate severity, vaccinated from the seventh day of infection up to the onset; following on this the cases vaccinated after the onset of the disease will be seen to have been of the very severe type, three of them ending fatally, showing that cases vaccinated at the stage of onset and

after the rash has appeared, have much less chance of benefitting by the vaccination."

In regard to cases re-vaccinated before the onset of symptoms in nearly all, the cases were of a mild or very mild type. The cases vaccinated after the onset and subsequent to the appearance of the rash were mostly of a moderate or severe form.

Dr. Hanna, however, thinks that vaccination after the appearance of the rash may have a modifying influence, and he cites the case of a lady unvaccinated in infancy who was vaccinated one day after the appearance of the rash. In this case the vaccination aborted and the smallpox attack was severe, but the pustules began to dry up from the twelfth to the fourteenth day of the disease. Vaccination, he thinks, requires nine days to develop an immunity which will absolutely prevent or minimise an attack of smallpox.

It is interesting in connection with the period after exposure to smallpox infection at which vaccination will prevent or modify the attack of smallpox to recall Marson's experience at the London Hospital for smallpox at Highgate. Marson found that if an unvaccinated person be exposed to infection on a Monday, vaccination on Tuesday or Wednesday prevented the development of the smallpox, vaccination on Thursday led to its modification, and vaccination on Friday had no result upon the ensuing smallpox. Re-vaccination was found to have effect two days later than primary vaccination, owing to the more rapid development of the vaccination vesicle.

Dr. Hanna's book gives evidence of painstaking observation and careful record, and we confidently commend it to our readers. There is a probability that others will have opportunity in this country of making like observations at no distant date, and to them this work will present matter of considerable interest. It is freely illustrated with excellent representations of smallpox eruptions, which materially add to its value.

THE WEIGHING OF SCHOOL CHILDREN.

The Sheffield School Management Sub-Committee have recommended to the Education Committee that arrangements be made for all the elementary school children to be weighed in school every six months, and that teachers be requested to call the attention of the School Medical Officer to any child whose weight diminishes or remains stationary. It is recommended also that teachers be notified that the Committee look with approval upon the use of the playgrounds for teaching purposes during suitable weather. Inquiries are to be made as to the use of parks and bandstands for open-air teaching.

CONGRÈS INTERNATIONAL DE L'ÉDUCATION PHYSIQUE.

AN International Congress on Physical Education, held at Paris from March 17th to 20th, under the patronage of the President of the French Republic, was attended by representatives from all parts. The programme contained papers, discussions, and demonstrations of methods by selected teams, which indicated the high standard of performance now attained in the schools and colleges of Europe.

Physical education was considered under three main headings—scientific, pedagogical, and applied gymnastics and sports. In the scientific group the discussions centred round the methods of increasing the bodily powers of resistance to cold and the use of gymnastics in the treatment of physically and of mentally defective children. Testimony was given to the great advantages of special classes for retarded children prior to their admission to the ordinary school courses of gymnastics, and to the advisability of the supervision of all forms of physical education by the school doctor. Several communications dealt with breathing exercises, the general conclusions being that, while the respiratory mechanism was most effectively trained by indirect measures, as by graduated running, controlled deep breathing should be practised daily as a part of the gymnastic course. Nevertheless, gymnastics should not tend to be confined to breathing exercises or to the repetition of identical movements. The greatest importance was attached to abdominal exercises. This point is of interest to school doctors, for very commonly, owing to difficulties of arrangement, this group is neglected in the drill classes of primary schools.

In the pedagogical section the opinion was expressed that the Swedish system was the most suited for the education of boys and girls of all school ages, and the rapid spread of this method in south-western Europe was prominently in evidence. The classes should be small, never exceeding 30 to 40 children for each instructor; the system of one instructor supervising the gymnastics of some 100 to 200 pupils at one time, with the aid of other pupils acting as monitors or squad leaders, was condemned.

The following resolutions were presented to the Congress for approval:—

- (1) That physical education should form part of the teaching in all primary schools on the same footing as other subjects of instruction.
- (2) That it should comprise gymnastics, games, and manual training.
- (3) That it should be a subject of daily instruction.

* Studies in Smallpox and Vaccination. William Hanna, M.A., M.D., D.P.H., Assistant Medical Officer of Health of the Port of Liverpool, Visiting Physician to the Port Isolation Hospital. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd.

- (4) That all candidates for public examinations should produce proof of having received such instruction.
- (5) That special playgrounds should be established in proximity to the schools of all large towns.
- (6) That it is indispensable to create normal schools of gymnastics.

English education was represented by a report from Mr. Cloudesly Brereton, who reviewed physical exercises in the light of education as a whole. He regarded the present diversity of methods as probably unsound, but considered that no system evolved by any one nation should be dumped down *en bloc* on the schools of another differing perhaps radically in physique and temperament. He suggested that each system in vogue should be appraised in the light of certain criteria:—

Does it regard gymnastics as a watertight compartment or as an organic part of education? Are its principles and practices immutable, or does it permit of orderly evolution with the changes in educational ideals? Are its basal conceptions static or dynamic? Is it so far dominated by the theory of "conscious attention" as to throw an undue strain on the younger pupils? Is it graded according to the season, the age, and the potentialities of the pupils? Does it permit of the expression of individuality? Does it lead up to and prepare for the concrete activities of daily life, or is it so analytic in its methods as to concentrate attention on movements rarely in practice found in isolated form? Does it develop grace and the artistic sense, appreciating the value of the creative spirit as opposed to mere mechanical technique? Does it recognise the moral value of emulation and personal prowess? Do jerky or continuous movements predominate? Does it by excessive discipline tend to become distasteful to the pupils, or does it promote a sense of pleasure and well-being? Unfortunately, the author, having laid down his criteria, did not proceed to apply them to present-day methods. It might well be argued that, while in the hands of the true teacher all systems would comply with the majority of his postulates, in the hands of an unsympathetic or unskilful teacher every system would be found wanting.

The reports of this Congress contain much that would interest any medical officer who pays special attention to the question of physical education.

THE DESTRUCTION OF RATS.—The practice of boys pulling down blind cords, dragging them in the mud, and selling them as rats' tails to obtain the reward for rat-killing, has been reported to the Saffron Walden Town Council.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856. RECONSTRUCTED 1883.
INCORPORATED 1892.

PROVINCIAL MEETING.

THE Provincial Meeting of the Society was held in the Botany Theatre of the University of Liverpool on Saturday, May 24th, 1913. The following were present:—The President, Professor E. W. Hope, Drs. T. Ridley Bailey, Armley Ashkenny, Francis Vacher, A. A. Mussen, C. O. Stallybrass, W. B. Simpson, J. Coote Hibbert, W. L. Hawksley, Ronald T. Herdman, Clifford C. Pickles, T. Shadick Higgins, John Dale, E. Bertram Smith, Duncan J. Mackenzie, R. E. Williamson, Jean R. Shaw, Cecil Berry, J. J. Butterworth, A. Jones, John Dallewy, T. B. Flint, R. A. Forsyth, Rory E. McLaren, Thomas Orr, Maurice Gepp, R. A. Askins, W. Stewart Stalker, Alice Stalker, Cameron Gibson, F. E. Wynne, T. D. Paddock, Leslie Kingsford, C. Rundle, G. W. N. Joseph, W. F. Dearden, James A. Harris, James B. Wilkinson, R. Sydney Marsden, G. H. Pearce, E. M. Smith, Herbert Peck, William Hanna, W. E. Burton, A. B. MacMaster, John J. Buchan, Frank Hauxwell, J. D. Buchanan, Frank Webb, C. W. Paget Moffatt, Myers Coplans, Edward Sergeant, J. A. Harris, T. Fisher, J. A. Sutherland, G. H. Pearce, W. Allen Daley, C. Boyd, Cameron Gibson, C. Wills, S. L. Melville, J. Green, A. Banks, A. Richmond, T. H. Peyton, Lewis Thomson, T. G. Shand, John A. Watts, H. M. Cargin, and Herbert Jones.

The minutes of the last Provincial Meeting, held at Stratford-upon-Avon on June 29th, 1912 (see PUBLIC HEALTH, August, 1912, p. 438), were taken as read, approved and signed as a correct record of the proceedings.

A letter was read from Dr. A. K. Chalmers expressing his appreciation of the action of the Society in electing him President for the Session 1913-1914.

ELECTIONS:—The following candidates, who had been duly nominated, were balloted for, and the President declared them to be duly elected Fellows:—

Fredk. G. Caley, M.A., M.B., D.P.H., 4, Burston Road, Putney, S.W.; Elsie Mary Chubb, B.A., M.D., B.S., 33, Alfred Road, Acton, W.; William H. Dickinson, M.B., Ch.B., D.P.H., Jarrow-on-Tyne; Laurence Gibson, M.B., D.P.H., Oulton Broad, Suffolk; Agnes I. Maclaren, M.B., C.M., D.P.H., Public Health Department, Huddersfield; Reginald W. Stocks, L.R.C.P., M.R.C.S., D.P.H., Health Department, West Bromwich; Mary Thomson, L.R.C.P., L.R.C.S., D.P.H., Public Health Office, Huddersfield.

NOMINATIONS:—Several candidates were nominated for election.

DR. C. O. STALLYBRASS read a paper on "The Causes of the Declining Incidence of Typhoid Fever," and in the subsequent discussion the

following members took part:—The President, Dr. J. B. Wilkinson, Dr. Vacher, and Dr. Sydney Marsden.

It was unanimously resolved, on the proposition of DR. RIDLEY BAILEY and Dr. J. B. WILKINSON, that the best thanks of the Society be given to the Health Committee and the Housing Committee of the Liverpool Corporation for the facilities which had been given to the members to visit the housing schemes of the Corporation.

It was unanimously resolved, on the proposition of DR. VACHER and DR. SYDNEY MARSDEN, that the best thanks of the Society be given to the Vice-Chancellor of the Liverpool University for the facilities which had been given for holding the meeting in the University buildings.

It was resolved unanimously, on the proposition of the PRESIDENT and DR. HERBERT JONES, that the best thanks of the Society be given to the chairman and members of the Ferries Committee of the Corporation of Birkenhead for their courtesy in granting the use of a launch for the river cruise.

The members and their friends were entertained to luncheon at the Adelphi Hotel by the Lord Mayor and Lady Mayoress of Liverpool, when, in addition to those who attended the meeting, there were also present, among others:—Mrs. E. W. Hope, Mrs. Vacher, Mrs. E. Sergeant, Mrs. Mussen, Mrs. Gibson, Mrs. Harris, Mrs. Wilkinson, Mrs. Hanna, Mrs. Dearden, Mrs. Pearce, Mrs. Daley, Mrs. Burton, Mrs. Smith, Mrs. Hawksley, Mrs. Coote Hibbert, Mrs. Forsyth, Mrs. Flint, Mrs. McKee, Mrs. Herbert Peck, Mrs. Gardner-Medwin, Miss Paddock, Miss Violet Cleese, Miss Curran, Miss Dallewy, Dr. Utting, Alderman J. T. Thompson, Mayor of Birkenhead, Dr. White, Mayor of Glossop, Alderman Menlove, Alderman W. T. Fiddes, Alderman E. G. Mason, Drs. Fisher, Gardner-Medwin, and Rundle, and Messrs. F. S. Legge, D. Lewis, Wadsworth, J. MacLeod, Percy Wolf, Eli Coplans, F. T. Aman, J. Taylor and J. McCoy.

In the unavoidable absence of the Lord Mayor the chair was occupied by Dr. Utting, the Deputy Lord Mayor. After the loyal toasts had been honoured, the MAYOR OF BIRKENHEAD proposed the toast of "The Society of Medical Officers of Health," to which the President responded, and proposed the toast of "The Deputy Lord Mayor."

DR. UTTING, in responding, referred to the great progress which had been made in Liverpool as regards sanitation during the past twenty-five years, a period which corresponded to that during which Dr. Hope had held office. Liverpool, he said, was a pioneer in re-housing schemes, and had dealt with the question long before the Housing, Town Planning, etc., Act was passed into law.

In the afternoon motor cars were placed at the disposal of the members by the Housing

Committee of the Liverpool Corporation and a long tour was made during which were visited the recently constructed suburban roads, the Town-Planning Schemes, the garden city and the Corporation working class dwellings. Tea was served at Calderstones Park.

Those who did not undertake the motor tour had a most enjoyable cruise down the river on a steam launch which had been placed at the disposal of the Society by the Ferries Committee of the Birkenhead Corporation. A smooth sea and a cloudless sky combined to make this trip particularly enjoyable.

From every point of view the Liverpool Provincial meeting of the Society will long be a pleasurable memory for those who were fortunate enough to participate in it. The arrangements for the meeting were carried out by Mr. McCoy, of the Public Health Department, with a thoroughness which ensured for it the success which it undoubtedly deserved.

Yorkshire Branch.—A meeting of the Yorkshire Branch took place during the Doncaster Health Week at the Mansion House, on April 9th, 1913, and was attended by the following members:—Drs. A. Anderson, Wortley; D. L. Anderson, Doncaster; Arbuckle, Thorne; Atkins, Wombwell; Brewer, Wakefield; Burman, Wath; Campbell, Wakefield; Corbett, Sheffield; Coupland, Harrogate; Castle, Darfield; Erskine, Goole; Forsyth, Bradford; Gibson, Wakefield; Halliwell, Dewsbury; Huey, Mexborough; Hicks, Easingwold; Jefferson, Ripon; Jones, Halifax; Jubb, Wakefield; Mason, Northallerton; Martin, Brighouse; Mair, Harrogate; Menzies, Rawmarsh; Milne, Penistone; Moore, Huddersfield; Neech, Halifax; Peyton, Wakefield; Richmond, Wakefield; Robinson, Rotherham; Smith, Barnsley; Smith, York; Sproull, Castleford; Trotter, Holmfirth; Templeton, Doncaster; Mitchell Wilson, Beverley; Wiltshire, Hems-worth; Webster, Golcar; Wear, Leeds; McCririck, Leeds; and J. R. Kaye, Wakefield.

A discussion was opened by the medical officer of health for Doncaster, Dr. D. Lechmere Anderson, on "The Importance to the Nation of a National Health Week," the audience including about 200 members of the public.

The members were afterwards entertained to luncheon at the Mansion House by the Mayor and Corporation of Doncaster. In welcoming the members to Doncaster the Mayor remarked that the Corporation and the inhabitants were very pleased to have such a gathering in the town during their Health Week, and he observed that a Society like the Medical Officers of Health would, in his opinion, do more good in promoting the health of the people than any other combination of agencies. The President, Dr. Anderson, of Wortley, thanked the Mayor and Corporation for

the luncheon. Mr. Martin, a representative from the Agenda Club from London, seconded the vote of thanks, which was supported by Dr. J. R. Kaye.

A visit was then made to the Health Exhibition, and the members were later given an excellent tea.

In the evening Dr. Kaye, the county medical officer, delivered an address to a large audience on "The Scholar in Relation to his Future Position as a Citizen and Ratepayer."

North-Western Branch.—A meeting was held at the Grosvenor Hotel, Manchester, on Friday, April 18th, 1913. Present: Dr. Meredith Young (in the chair), Drs. Burton, Wynne, Berry, Gibson, Daley, Welsh, Martin, McMaster, Hitchon, Corbin, Wheatley, Sergeant, Marsden, Paddock, Holden, Talent, Fraser, Webb, Wilkinson, Dearden, Barlow, and the following visitors:—Drs. Hauxwell, Jessel, and Laing. Apologies for inability to be present were received from Drs. Buchan, Garstang, Brindley, and Buchanan.

The President invited the Branch to hold its June meeting in Chester, and it was resolved that this be done. The President and Secretary were appointed a Sub-Committee to make the necessary arrangements.

Dr. Meredith Young read his paper on "The Relation of Medical Benefit under the National Insurance Act to the Public Health." This was followed by a long and interesting discussion, in which Drs. Wheatley, Marsden, Sergeant, Wynne, Jessel, Corbin, Martin, and McMaster took part.

A cordial vote of thanks was accorded to Dr. Young for his paper.

Southern Branch.—A meeting of the Branch was held at the Town Hall, Portsmouth, on Friday, May 2nd, at 2.30. Present: Dr. Lockhart Stephens (chair), Drs. Forbes, Wilshaw, Fairley and Fraser (hon. sec.).

The minutes of the last meeting were read and confirmed. Letters of apology for absence were read from Drs. Gibson, Willoughby, Goodwin, Livingstone, Stott, Lauder, Cameron and Hoyle.

A discussion took place on the action of the Brighton Division of the B.M.A. in regard to Dr. Forbes.

In view of the absence of the President, Dr. Gibson, it was decided to ask him to give his Presidential Address on "The Progress of Sanitary Science and Anomalies of the Present Sanitary Service" at the next meeting of the Branch, to be held in the Isle of Wight on Friday, June 6th.

Dr. Lockhart Stephens' invitation to hold the July meeting of the Branch at Emsworth was accepted with pleasure.

A discussion took place on the administration of sanatorium benefit.

Metropolitan Branch.—A meeting of this Branch was held on Friday, April 25th, 1913,

at No. 1, Upper Montague Street, Russell Square, W.C., at 4 p.m. Present: Dr. Annis (in the chair), Drs. Bond, Caley, Lennane, Sandilands, Caldwell-Smith, Spaul, D. L. Thomas, and Porter (hon. sec.). The minutes of the last meeting were read and confirmed, and the hon. secretary reported that a meeting of the Council of the Branch had been held that day, but that no business calling for special mention had been transacted.

DR. CALEY, medical officer of the Wandsworth Tuberculosis Dispensary, read a paper on "Some Points in the Treatment of Pulmonary Tuberculosis in Children," describing results obtained in cases treated by means of tuberculin. The paper, which was an exceedingly practical one, was greatly appreciated by the members present, and at its close a number of questions were put, to which Dr. Caley replied. A vote of thanks, proposed by the President, was unanimously accorded to Dr. Caley for reading the paper.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

February 6th, 7th and 12th, 1913.

BEFORE LAWRENCE, J. AND A SPECIAL JURY.

SKATE v. SLATERS (Limited).

Sale of Food—Implied Warranty—Negligence—Alleged Ptomaine Poisoning.

This was an action brought by a member of the London Stock Exchange for damages for personal injuries alleged to have been occasioned by eating unsound food supplied by the defendants. The claim was founded on breach of warranty that the food was wholesome and alternatively on negligence.

It appeared that the plaintiff lunched on February 20th at a restaurant of the defendants and that about 2.30 that afternoon he was seized with violent pains, vomiting and diarrhoea. In the evening he was worse and sent for a doctor. He was unable to return to work until March 14. He had had the same trouble again in the following June and again in August. Another attack had followed in September and necessitated his going to a nursing home until December 21st. This last attack was more serious than the others and had come on quite suddenly. Up to the date of his first illness on February 20th he had had excellent health.

On the day in question he had breakfasted at his club and had had porridge, an apple and china tea, and up to lunch time he had been perfectly well. At lunch he had mutton curry and potatoes and bread and he had shared a bottle of champagne with a friend. The friend had also had curried mutton and had not been ill.

The doctor who attended the plaintiff considered the illness might have been caused by either metal

or ptomaine poisoning. Dr. Willcox stated that he thought the illness was due to the curried mutton.

For the defence evidence was given to the effect that a number of people had curried mutton on the day in question and no other complaint had been received, and also as to the care taken at the restaurant to provide high-class food of wholesome quality. Tinned tomatoes were used for the tomato puree and the chef explained that tinned tomatoes gave a better flavour than fresh native tomatoes.

Medical evidence was given to the effect that while the symptoms were consistent with food poisoning, they were also consistent with other troubles, such as duodenal ulcer, gastritis or colitis.

LAWRENCE, J., in summing up, pointed out that it was for the plaintiff to prove beyond all reasonable doubt that improper food supplied by the defendants was the cause of his illness.

The jury were unable to agree as to their verdict and were ultimately discharged.

The defendant, on the ground that there was no case to go to the jury, applied for judgment but this was refused.

KING'S BENCH DIVISION.

April 2nd, 1913.

BEFORE RIDLEY, PICKFORD AND AVORY, J.J.

LOWRIGHT v. BURRELL.

Sale of Food and Drugs Acts—Milk—Warranty—Qualification of Warranty.

A warranty limiting the responsibility of the vendors to the time when the goods are taken over by the purchasers, except for the purpose of the Sale of Food and Drugs Acts, affords a valid defence to proceedings for selling an article not of the nature, substance and quality demanded.

This was a case stated on the hearing of an information charging the defendant Plowright (the appellant) with selling milk not of the nature, substance and quality demanded. The analysis showed a deficiency of 29 per cent. of fat in the sample taken. The defence set up was a warranty as follows:—

On April 1st, 1912, the appellant entered into an agreement with the Dairy Supply Company (Limited) for the purchase of milk, whereby the company agreed to supply and the appellant to take from the date of the agreement until March 31st, 1913, the whole of the new milk required and sold or used in connection with his dairy business at 107, Kingsdown Road, or wherever such business might be removed to, amounting to an estimated quantity of 16 barn gallons daily to be delivered at the above address. The company by the agreement warranted that each and every consignment of milk delivered under the contract should be pure, genuine new milk with all its

cream according to the conditions of the Food and Drugs Acts.

The agreement further set out that the company took great precautions to obtain a supply of pure milk with all its cream and to deliver the same in that condition to the buyer; and it provided that after delivery no responsibility was taken by the company except under the Food and Drugs Acts, and that for all other purposes the buyer must satisfy himself at the time of delivery that the milk was sweet, pure, and sound, and contained all its cream, and if the milk was accepted by the buyer he was to be precluded from making any claim for compensation.

The milk in question was purchased under this agreement and was sold in the same state as purchased. The appellant had accepted the milk, and it was admitted that he was not entitled to make any claim in respect of it against the said company.

The magistrate convicted, but the divisional court allowed the appeal. The contention of the respondents was that the warranty was not in existence at the time the sample was taken, and a warranty must be a good one for all purposes.

RIDLEY, J., said he thought the case was covered by authority. It was indistinguishable from *Wilson v. Playle* (67 J.P. 263, 88 L.T. 554). The appeal must be allowed and the conviction quashed.

PICKFORD and AVORY, J.J., agreed.

SODIUM FLUORIDES IN BUTTER.—At Tower Bridge police court, on March 19th, before Mr. Cecil Chapman, the Union des Beurreries de France, of Tooley Street, were summoned by the Bermondsey Borough Council for selling butter to the prejudice of William Pepper. According to the certificate of the Public Analyst the sample of butter contained fluorides equal to 0.21 per cent. of sodium fluorides.

Dr. R. K. Brown, medical officer for Bermondsey, said that hydrofluoric acid was very poisonous, and was one of the strongest corrosive mineral acids known. The Public Analyst had by means of the hydrofluoric acid evolved from the sample of butter succeeded in doing some etching upon a piece of glass. The proportion was nearly a grain of fluorides per ounce of butter, and it was quite conceivable that a person eating such butter would be taking poison to the extent of three to six grains daily.

The defendants stated that they used this preservative accidentally and in ignorance. It was supplied to them by a manufacturer of preservatives in error. It was intended for a firm in Holland, where, apparently, the law was different, but by a mistake it was sent to them, and the barrel that they ordered was forwarded to Holland.

MR. CECIL CHAPMAN.—The case was quite properly brought, but it proves to be an accident; and I wish to say nothing against the defendants. The summons will be dismissed, on payment of ten guineas costs.

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VOL. XXVI.

THE PREPARATION OF MEAT FOODS.

THE NECESSITY FOR INCREASED CONTROL.

THE North Western Branch of the Society of Medical Officers of Health has suggested the registration of all places where meat foods for human consumption are cooked or otherwise prepared, with power to local authorities to refuse registration if the regulations are not complied with. The employment of the act of registration as a license has already been accepted by Parliament. The London County Council obtained this power in respect of milk premises in 1908, and Mr. Burns has adopted the same principle in his Milk and Dairies Bill now before Parliament. The only question, therefore, which should arise is whether the circumstances justify the application of special powers of this kind to premises "where meat foods for human consumption are cooked or otherwise prepared."

We cannot think that any reasonable doubt on this matter can be felt by medical officers of health who have made themselves acquainted with the numerous records of outbreaks of disease, often fatal disease, which have, from time to time, resulted from the consumption of articles of meat food. An excellent account of these outbreaks is given by Dr. A. B. McMaster in our current number. It is obvious that there is strong reason for believing that much could be done to limit these occurrences by design of the premises on which the work is carried out and by the adoption of proper precautions, which he indicates.

The opinion has for some time been growing that places where meat foods are prepared for human consumption should be subject to special control. In 1908 the London County Council obtained powers for requiring that all places where food is prepared or deposited for sale should comply with certain specified conditions and that due cleanliness should be observed both in the persons employed and in the places in which the work was done. This

last condition relating to cleanliness was the most valuable part of the section which was included in the Council's General Powers Act. At least one other authority has endeavoured to secure like powers for their district but their efforts have been unsuccessful, apparently because they failed to satisfy the Committee of Parliament, before whom they appeared, that the special circumstances of their district made necessary the application of powers which went beyond those which were in force in the country as a whole. We think this is to be regretted. Many of the most useful provisions which now are incorporated in our Public Health Acts had their origin in local Bills, and based as they were upon the experiences of health officers who were actually engaged in the work of prevention of disease, they have been found to be effective, and have paved the way for additions to the general public health law when Governments had the opportunity to secure legislation.

THE LATE DR. HERBERT MANLEY.

OUR last number contained an obituary notice of the late Dr. Herbert Manley, whose death has removed from among us an especially able and zealous worker in public health. It is with much regret we learn that his widow has been left in circumstances which make it desirable that a fund should be raised for her assistance. We commend this proposal to all Fellows and Members of the Society able and willing to contribute.

The following Fellows have already signified their desire to subscribe:—

The President, Dr. E. W. Hope	£5 0 0
Dr. George Reid	... 5 0 0
Dr. Bostock Hill	... 5 0 0

The Hon. Treasurer of the Society will be happy to receive any further contributions, which should be addressed to 1, Upper Montague Street, Russell Square, London, W.C.

MEAT POISONING AND ITS ADMINISTRATIVE CONTROL.*

By A. B. McMASTER, M.D., D.P.H.,
Medical Officer of Health, Crewe.

I VENTURE to bring this subject before the Branch this afternoon because, while collecting information as to the probable origin of a local outbreak, the need that exists for more rigorous and systematic control over premises where cooked foods made from flesh are prepared was plainly demonstrated.

Since the Welbeck outbreak in 1880 the attention of medical practitioners and medical administrators has been repeatedly directed to the disease produced by this poisoning, and more and more investigations have been carried out to detect and isolate the active agent, to define the means by which the particular foodstuff became contaminated, and to decide upon measures calculated to prevent recurrence.

I. Consideration may be directed, first, to outbreaks in general.

In the last 3 years 16 outbreaks of greater or less severity have been reported, with reference to which information has been collected. Seven hundred and sixty-six persons were affected, with 13 deaths—in one instance 213 suffered and 5 died; in another, 168 suffered, 1 died; while in a third, 107 suffered and 5 died. The offending articles of food in these 3 cases were pork brawn and roast pork, pork pies, and pork pies respectively. In 20 other infections prior to these, the persons numbered 73, with 9 deaths, and 221, with 4 deaths—beef and pork pies the medium of infection. Thus, in 18 separate outbreaks, 1,060 persons were involved, of whom 26 lost their lives. Whitelegge and Newman cite 18 other outbreaks between 1880 and 1907, in which 1,008 persons were involved.

An analysis of these 36 epidemics, as to the probable vehicle of infection, gives this result:—

In 21, pig in one form or the other;

In 10, beef or veal; and

In 5, tinned or corned beef, mutton or fish was the foodstuff consumed.

I say probable, because, although the clinical and epidemiological evidence has been conclusive in each case, the difficulty of completing the chain by full bacteriological investigation is known to all administrators. Even the most prompt inquiry into an outbreak may fail to secure a specimen of the offending foodstuff. Further, when a sample is available the bacilli isolated from it and those obtained from the

ejecta of the sufferers, while belonging to the same group of micro-organisms, may not, under Koch's cardinal rules, be identical in all cases.

The 21 outbreaks through pig infection involved...	1,320 persons.
The 10 outbreaks through beef infection involved...	671 persons.
The 5 outbreaks through tinned or corned meats infection involved...	77 persons.
	2,068 persons.

Or, to put in percentages, about 63 per cent. were infected through foodstuffs prepared from swine, 33 per cent. through foodstuffs prepared from bovines, and about 4 per cent. through tinned or corned preparations.

Can one wonder, then, that the Mosaic law cited the "porker" as an unclean animal, or that the faithful Israelite still refuses to partake of such food? One is rather led to infer that the Biblical injunction was a sound public health bye-law for the effective administrative control of meat poisoning.

II. As to some of these outbreaks in more detail.

Time will not permit of a full consideration of all the available records and investigations, consequently one has selected 6 outbreaks where fatal cases occurred, and one other for comparison.

In the Derby (1902), Wrexham (1910), Chesterfield (1911), Bacup (1911), and Crewe (1911) outbreaks the foodstuff involved was pig; in the Limerick (1908) outbreak, beef; and in the Newcastle-upon-Tyne (1910) outbreak, tinned mutton (Australian).

(A) Outbreaks where swine flesh, etc., was the food-stuff eaten.

1. The Derby Outbreak, 1902¹.

Two hundred and twenty-one persons were infected by pork pies from a pork-butcher's shop, the incubation period varied from 4 to 24 hours, and 4 fatal cases occurred in non-residents. The infecting organism was the *Bacillus Enteritidis Derbiensis*, isolated and described by Professor Délepine.

The main conclusions Dr. Howarth arrived at were:—

- That the meat of the pies was the infected portion.
- That the flesh of the animal was not infected at the time of slaughtering, but that the meat became contaminated during preparation in the chopping-house.
- That the infection, which was of excretal origin (*vide* Professor Délepine's report), most probably gained access to the chopping-house in the large intestines which were brought into this place on September 2nd.

iv. That if the intestines contained the bacillus responsible for the outbreak, the work of cleansing and preparation of these organs for sale was conducted under conditions which exposed the chopped meat to risk of contamination by the bacillus.

2. The Wrexham Outbreak, 1910².

In this case 100 persons were infected by pork pies, purchased from a confectioner's shop, and 7 others by contact with the primary sufferers. There were 5 deaths.

The organism isolated was *Bacillus Paratyphosus B*, and from the results of the inquiry by Dr. Williams and the analysis by Dr. W. R. Smith it was known that the pies became infected in the bakery, and the evidence was practically conclusive that the head cook was the "carrier" of the infecting organism. One rather interesting point was found during the investigation, *i.e.*, that the blood of the boy whose work it was to gravy the pies in the bakery gave a positive re-action with the *Bacillus Paratyphosus B*, although no bacilli could be isolated from his excreta. Later it transpired that he had eaten some of the infected pies without any clinical symptoms developing.

3. The Chesterfield Outbreak, 1911³.

168 persons were infected from pork pies supplied from a pork butcher's shop; there was one fatal case. Dr. Peck, in his report, shows that only a certain quantity of the pies baked on a particular day acted as the medium of infection, and that this was the quantity which had been gravied from one particular tin of jelly. The infection was conveyed to the pies after baking, through the jelly, which must have been contaminated while cooling in an air passage between the slaughter-house and the cooling and lard rendering room. How the organisms gained access to the jelly could not be determined, whether the fat seal had been broken or the organism had penetrated through some gelatine or proteid matter remained unsolved. Dr. Thomson carried out experiments with the object of ascertaining whether the fat seal of this jelly was an effective protection against the inroads of excretal organisms or not, and he found that it was not. Mutton suet or paraffin coated over the jelly excluded these organisms. The infecting organism isolated by Dr. Thomson was the *Bacillus Suipestifer*, and the presence of *Bacillus Coli* and *Bacillus Enteritidis Sporogenes* in the pork pie as well as additional evidence that the outbreak was excretal in origin. The infecting organisms in the pies increased in virulence with

age; patients who ate the pies six days after they were made developed symptoms in 22½ hours as compared with 22½ hours of incubation when the pies were eaten the day after being baked.

4. The Bacup Outbreak, 1911⁴.

Dr. Browne's report records that 213 persons were infected, and the clinical history indicated that brawn and roast pork were the articles of food which had infected them. There were 5 deaths, 1 of which was due to suicide, the jury's verdict: "Suicide by drowning, following ptomaine poisoning." Bacteriological examinations of the blood, spleen and intestinal contents resulted in the isolation of an organism of the *Bacillus Enteritidis* (Gaertner) group. None of the brawn or roast pork sold was available for bacteriological examination, hence, as Professor Délepine's report states, the evidence was incomplete in that respect. The structural arrangement of the premises afforded facilities for contamination of the foodstuffs.

5. The Crewe Outbreak, 1911⁵.

i. History of the infection.

On October 19th a medical man informed the Health Department that he had the previous evening and during that morning seen in two households 12 patients who were suffering from symptoms of meat poisoning. The first household visited by me on the same date consisted of 9 persons: father, mother, 3 sons, 3 daughters and the paternal grandmother. With the exception of the mother, all were ill and all suffered from gastro-intestinal symptoms which began at varying intervals after the consumption of potted shank of pork on October 17th at 1 p.m. Half a pound of this potted shank had been purchased. At the time of purchase there was no evidence so far as sight, taste or smell could detect that it was otherwise than perfectly wholesome.

Continued enquiry showed that in all, 12 households were involved in the outbreak, and of the 56 persons included therein, 42 were suffering from meat poisoning and 14 were not ill. 41 of those who were ill had eaten of the potted shank of pork, 1 had eaten of roast pork and the 14 who were well had not eaten of the potted shank but, in other respects, had had similar food to those infected in their respective households.

The incubation period varied from 4 hours to 28½ hours. In one case, that of a boy aged 2 years, vomiting took place as soon as he had eaten of the food, the regurgitated matter was the meat still in jelly form, and no symptoms

*Read at a Meeting of the North-Western Branch on 21st February, 1913.

developed subsequently. There were no fatal cases. Two were very protracted, in one of which a girl aged 4 years had very marked meningeal symptoms for several weeks and in whom convalescence was extremely slow. In the other protracted case, a man aged 50 years, toxæmia of the nervous system was marked.

The severity of the illness was in some cases apparently in direct proportion to the quantity of potted shank eaten.

ii. The foodstuff concerned and its preparation.

Potted shank of pork purchased on the 17th and 18th of October was partaken of by those affected and had been prepared, cooked and sold on premises within the borough. No cooking or other domestic preparation was applied to it in the homes.

Ingredients used:—

(a) Shanks of pork taken from the shop on Friday afternoon, October 13th, boiled for 2½ hours, boned, cut up and put into a tin with gelatine.

(b) Gelatine.

Slabs of French gelatine, liquefied with boiling water and mixed with

(a) in tin as follows:—

I. Layer of gelatine at the bottom of the tin.

II. The boned pork.

III. More gelatine poured on the top.

A wooden slab was then put on the top of the tin, and the whole pressed and allowed to cool in about the position indicated on Diagram A. The tin used was of 12 lbs. capacity.

The particular boiling of potted shank in question was removed from the tin on Saturday forenoon, October 14th, and portions of it first sold during that afternoon. What remained was placed in the cool-room for the week end. None, so far as could be ascertained, was sold on Monday, the 16th. 2 lbs. sold on Tuesday, the 17th, and 2½ lbs. sold on Wednesday, the 18th, were traced to the families where sickness developed.

Sketch I. shows the shape of the potted shank after it had been turned out of the tin. The portion marked X, from the bottom of the tin, was that sold on the 14th; that shaded and marked Y was kept over the week-end in the cool-room at the spot indicated by the circle. The portion marked Y would be that most exposed to external contamination while cooling after preparation.

Four of the persons who got ill stated that the portion they had eaten tasted nasty on mastication. No smell was detected before it was eaten.

On Wednesday, October 18th, before early closing at 1 p.m., the remaining pieces of the potted shank were thrown away, as they were broken up. The chief shopman stated that he had tasted a portion of it before it was removed, and that there was no smell or taste to indicate that it was unsound, and further that he suffered from no ill-effects.

The pork shanks used were from pigs purchased on October 9th and killed on the 11th or 12th. No veterinary surgeon specially examined the animals, but, so far as the butcher knew, they were sound. Further, that the consumption of the fresh shanks sold did not give rise to any known cases of illness is additional evidence of their soundness. And it is to be noted that no case of known illness occurred amongst those who purchased the potted shank on October 14th.

The only tin of potted shank found on the premises was one made on the 16th, two days after that associated with the cases infected. This was withdrawn from sale and samples analysed.

Bacteriological evidence from Dr. Sellar's report indicated that the contaminated pork was the cause of the outbreak, but it was not absolutely conclusive.

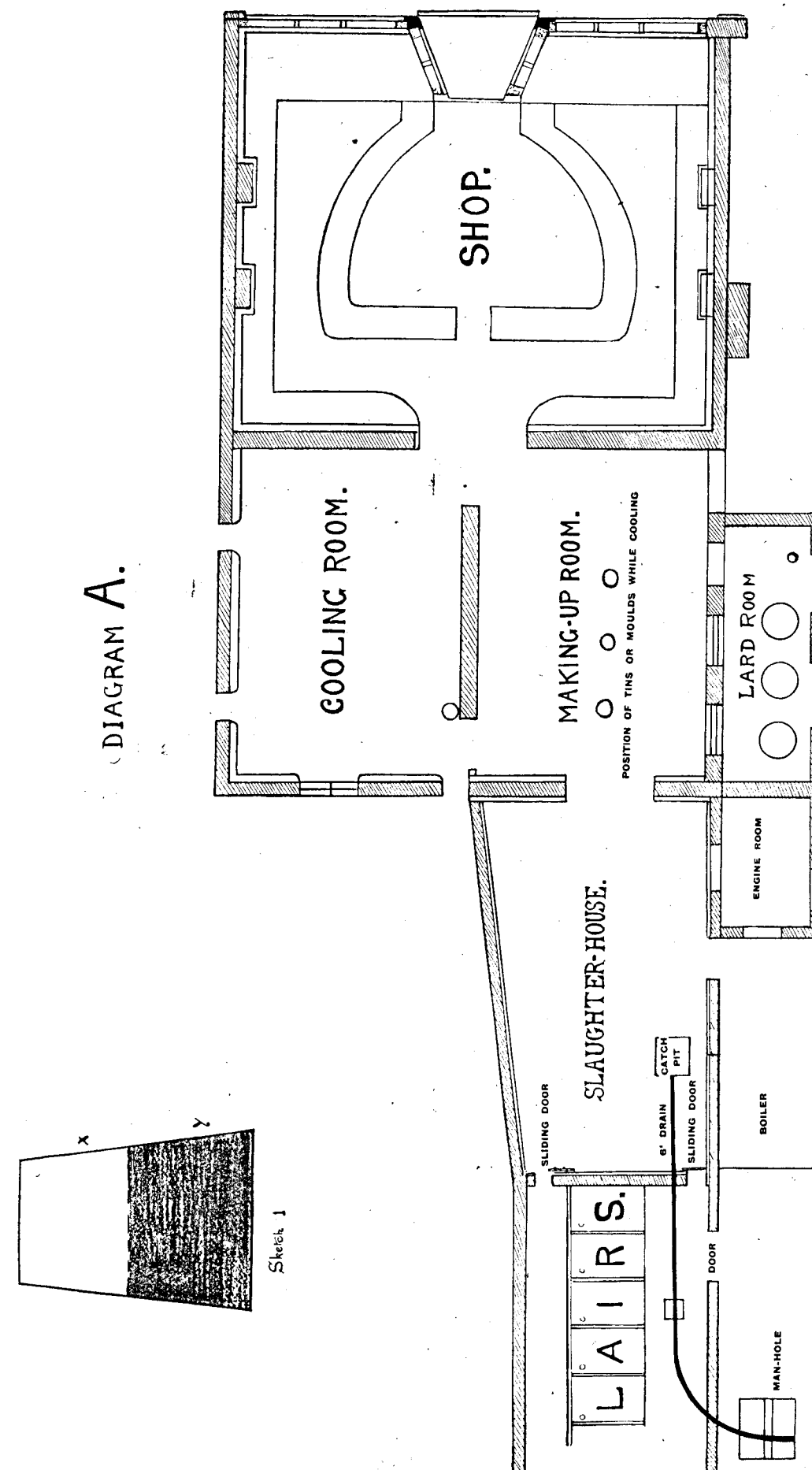
The bacilli isolated from the faeces of the sufferers and those from a small piece of the original potted shank found some days after the outbreak were of the B. Enteritidis (Gaertner) group, but not identical. B. Coli was also found in abundance. In the sample of potted shank made on the 16th another bacillus of the Enteritidis (Gaertner) group was found, together with B. Coli.

iii. The premises concerned.

There was no evidence to prove that any member of the staff of the premises concerned was a "carrier," or that the pork was infected ante-mortem; sources of contamination had to be looked for elsewhere, and a survey of the premises illustrated by the Diagram A was instructive.

DIAGRAM A.

The premises consisted on the ground floor of shop, cooling-room and cold air store with refrigerating plant, food preparing room, cooking and lard-rendering room, slaughter-house and lairages. These rooms adjoin each other



so as to form a continuous and inter-communicating set of apartments. In the cellar, reached from the cooling room, bacon, etc., was cured.

The construction of the shop and cold-air room was modern and satisfactory in all respects.

In the cooking room, food preparing room, slaughter-house and lairages, structural and other defects existed:—

- (a) The slaughter-house was separated from the food preparing room only by a sliding door, and as a rule there was free air communication and considerable traffic betwixt the two. Carcasses were taken from the slaughter-house through the food preparing room to the cooling room.
- (b) Two doors, in the north-west and south-west corners of the slaughter-house, led directly into the lairages.
- (c) Trapped drain inlets were situated in the cooking room, slaughter-house and lairages.
- (d) On a wooden bench in the slaughter-house, intestines were given a preliminary cleansing.

All the premises were systematically and thoroughly cleansed; utensils and apparatus used in preparing and making up foodstuffs scalded or otherwise cleaned after use.

Diagram B shows the alterations which have been carried out to remedy these defects.

From a review of all the facts in this outbreak the evidence pointed to the contamination of the potted shank either while the tins were cooling in a place opening directly into the slaughter-house or while the opened tin was allowed to stand exposed to aerial contamination over the week-end. That the former is the more probable is supported by the analytical results, which proved that the contents of the tin of potted shank made 2 days later, and only removed from the tin for bacteriological examination, were contaminated.

The weather during the week-end was close and hot and every facility was present to favour the growth of any bacteria which had already gained entrance into the cooked food.

B. Outbreaks where beef was the food eaten.

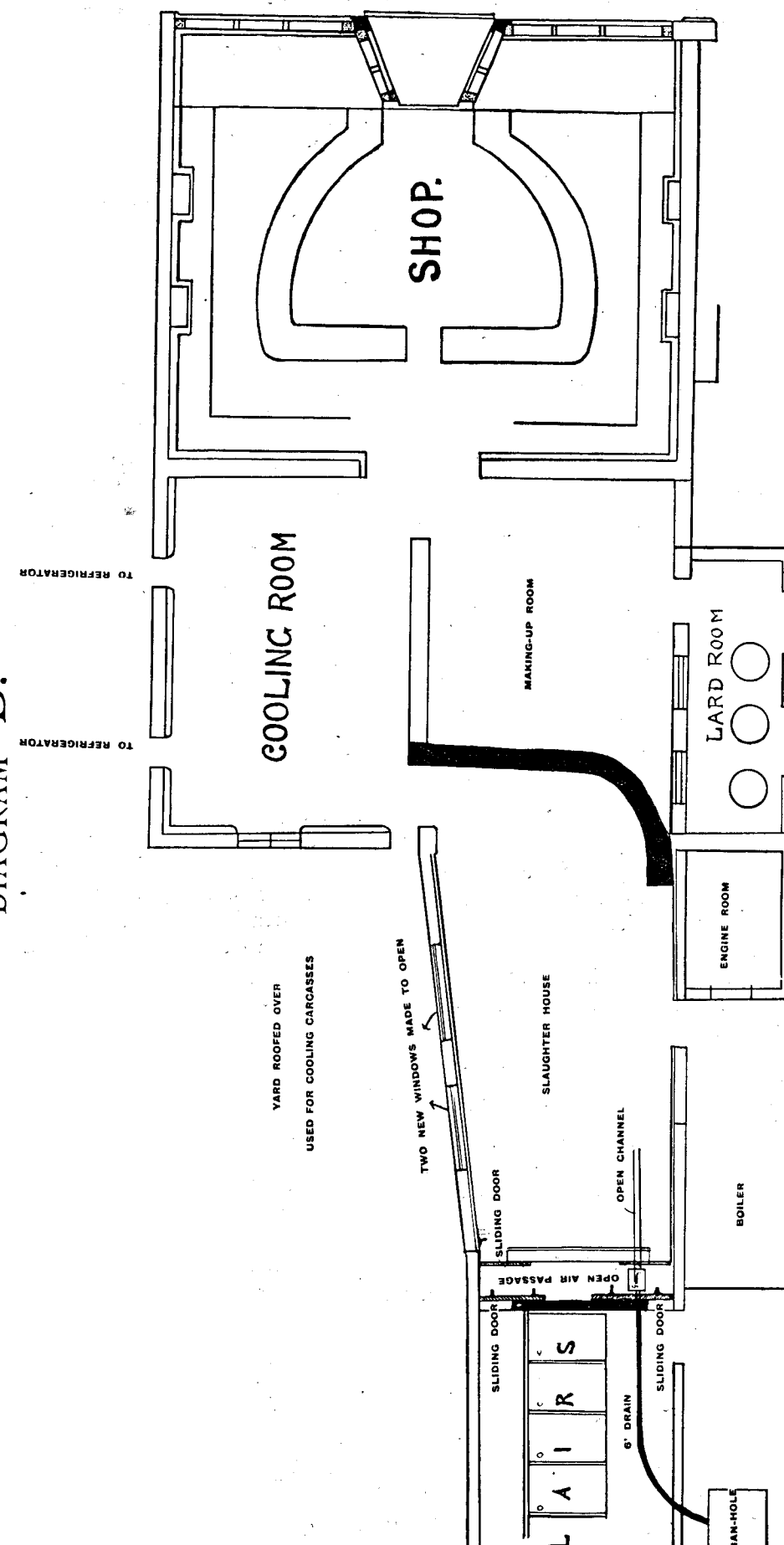
Turning now to an epidemic where beef was the vehicle of infection, that which occurred at the Industrial School in Limerick in 1908,⁶ reported by Professor McWeeney, affords the

best example. On November 3rd, 1908, at 6 p.m., an acute gastro-intestinal illness developed among the girls resident in the school. By midnight 28 girls were ill and 45 others by the next day (4th), two children died on the 4th, and 7 on the 5th. Cholera Nostras due to food poisoning was the post-mortem diagnosis. The bacteriological examination proved that the *Bacillus Enteritidis* (Gaertner) was the invading organism. All those infected had partaken of either a beef stew or some of the same beef cold or some cold bacon which had been in contact for 5 days with the cold beef.

The history of the animal from the carcase of which this beef was cut throws light on the outbreak. At the inquest it was recounted that the animal, a young Kerry heifer, was purchased on June 29th by a butcher who endeavoured to fatten the animal, but without apparent success. About October 19th the heifer was slaughtered by him and part of the carcase sold to the butcher who had the school contract. 3d. a lb. was paid by the contractor and he supplied it to the school at 5d. a lb., 8d. being the contract price for "prime" cuts of beef or mutton, and 5d. that for other parts. No authentic evidence could be produced as to the condition of the calf at or immediately before slaughter. As indicative of the type of meat two facts were recorded—that the contractor purchased the beef at an unusually low price and already killed. On October 24th, 5 days after slaughter, a part (38 lbs.) of the forequarter was sent to the school. All of this except 12 lbs. was cooked and eaten on October 27th without ill-effects. The 12 lb. piece (of ribs) was roasted on the 29th and partaken of by the teachers without ill-effects. About 3 or 4 lbs. of this roast beef was left over on the 29th and kept in the larder till November 3rd when it was cut up, the greater portion put into the stew and the remainder served cold. The stew was only warmed up, not boiled. Of the "first" class of 67 girls, 55 partook of the stew, 53 were acutely ill and the other two gave positive agglutination reactions with the *Bacillus Enteritidis* (Gaertner), although not clinically ill—8 of the deaths were in this class.

It is worthy of note that 15 days had elapsed between the slaughtering of the animal and the making of the stew on the day of first infection, and although the beef must have been very stale, no suspicion was apparently caused by any odour, taste or appearance.

DIAGRAM B.



THE TUBERCULOSIS ORDER OF 1913 AND ILLCIT TRADE IN DISEASED MEAT.

IT has probably fallen to most medical officers of health at one time or another to deal with the illicit traffic in meat of diseased animals intended for human food, and the question will no doubt occur to many officers of sanitary authorities at the present time as to how far the provisions of the recently issued Tuberculosis Order of the Board of Agriculture are likely to check the practices of unscrupulous traders in such meat. Hitherto, the so-called slink butcher has been in a position to out-bid the legitimate knacker in purchasing diseased or wasted cattle, or the carcasses of beasts which have died, and while securing for himself a large margin of profit has been able to undersell the honest butcher. The business has been a profitable one, and although illicit dealings of this kind involve certain risks of fines, or even of imprisonment, those engaged in the trade are generally sufficiently well acquainted with the weakness of the law and of administrative machinery to escape conviction. The resource shown by these individuals in securing the transit of their products from the country slaughtering place to the poorer part of some convenient town, where the meat quickly loses its identity in the sausage machine, is well known.

The scheme of compensation provided by the Tuberculosis Order for owners of cattle slaughtered in accordance with its provisions, should have the effect of limiting materially the market to which unscrupulous dealers of this kind look for their supplies. The Order provides for the slaughter of all bovine animals notified to the local authority which are found on examination to be suffering from tuberculosis of the udder, or giving tuberculous milk, or which are suffering from tuberculosis with emaciation. It is provided by the Order that the carcass of every animal so dealt with must be examined at the time of slaughter by a veterinary surgeon, who is required to give a certificate of the result of his examination, and if the local authority fail to have this examination carried out, they are obliged to pay to the owner the full agreed value of the animal and 20 shillings in addition. The amount of compensation to be paid by the local authority in other cases depends, in each instance, on the nature and extent of the disease found by the veterinary inspector to be present

in the carcass. Thus, if his certificate does not show that the animal was suffering from tuberculosis, the local authority must pay the full agreed value of the animal and 20 shillings in addition. If the certificate shows that tuberculosis was present, but not in an advanced form, the owner will be entitled to three-quarters of the agreed value of the animal; if in an advanced form to one quarter of that value.

The criteria adopted for distinguishing between "advanced" and "not advanced" tuberculosis in the carcass for purposes of compensation under the Order are those which were recommended by the Royal Commission on Tuberculosis as a guide for meat inspectors in deciding whether a given carcass affected with tuberculosis is fit or otherwise for human food. These standards, then, are meat inspection standards such as are in general use, and the compensation paid to the farmer under the Order will be in proportion to the money value of the carcass for food purposes. Local authorities will thus become owners of considerable quantities of meat of doubtful character, a certain proportion of which may, however, be found to be quite properly utilizable for human food. Except in the case of county and certain other boroughs, the local authority under the Order is not the authority directly concerned with matters relating to meat inspection, and it would appear that the duties of the veterinary inspector under the Order come to an end when he has examined the carcass and given his certificate in regard to its condition.

The arrangements made locally ought to enable full advantage to be taken of the examination required at the time of slaughter of these animals. The findings of the veterinary inspector as to the nature and extent of the disease should be made use of for the purpose of separating the sound from the unsound meat, and carcasses affected with advanced disease and diseased portions of other carcasses should be disposed of in such a way as to remove any possibility of their being used for human food. Unless active steps can be taken in this direction it seems probable that in some cases the illicit trader may still find scope for his practices even among carcasses of animals actually dealt with under the Order.

Where other diseases of cattle are concerned, e.g., anthrax, other septicæmias, the conditions which give rise to dropsy, etc., these traders

will find the conditions pretty much as they were before the Tuberculosis Order came into force. They will still, therefore, have a fairly wide field for their activities, even if satisfactory arrangements for controlling the disposal of meat slaughtered under the provisions of the Tuberculosis Order are generally established, and it would be very rash to assume in these circumstances that such a lucrative trade is about to suffer extinction.

HYGIENE IN THE BED FEATHER INDUSTRY.*

THE current number of this journal contains a paper by STEINHAUS on "Hygiene in the Bed-Feather Industry." The writer, working in feather-cleaning works in Dortmund, tested various methods of disinfecting feathers on a large scale, and in the paper in question he deals with the general hygiene of the subject. To illustrate the possible risks lurking in dirty feathers, he quotes an epidemic of smallpox which occurred in Breslau, in 1906, due probably to infection conveyed through uncleansed Russian feathers.

The process of feather-cleaning may be briefly summarised:—The raw feathers are freed, first from gross impurities such as stones, animal excreta, bran, worms, etc., then from the finer dust by passage through revolving drums. This mechanical cleaning lasts for 10 minutes, and the writer notes the large proportion of adventitious matter found in the raw article. Thus, a sample of Chinese raw feathers lost 32 per cent. of its weight during mechanical cleaning. After this preliminary treatment the feathers are first subjected for 10 minutes to the action of steam at a pressure of 2½ atmospheres and a temperature of 137° C, then exposed to dry heat for 10 minutes, and finally shot into a room on the floor of which they settle.

The author found that feathers subjected to this process were not rendered bacteriologically sterile; but that they could be made so if a suitable proportion of formaldehyde were introduced during the stage of steaming. The amount of formaldehyde needed varied, according to the source of the feathers, from 75 to 100 grammes per cubic metre of space in the disinfecting chamber. Steinhaus advocates proper disinfection of raw feathers as essential to the interests both of workers in the industry and of the general public.

AN OUTBREAK OF TYPHOID FEVER DUE TO BEER.—Voigt, in a paper on "A Contribution to the Etiology of Typhoid Fever," gives an account of an epidemic of typhoid fever occurring in August, 1911, in the district of Templin. The epidemic involved 230 people, distributed through several adjacent towns. The outbreak was traced to beer which the victims had imbibed freely during the hot weather. The beer came from a single brewery at which an attendant, whose duty it was to run the beer into casks, was found to have had typhoid fever for some weeks before the general outbreak.

*Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege, Bd. 24, Heft 4 (ii) 1912.

AN OUTBREAK OF FOOD INFECTION IN MANCHESTER.*

By W. ST. CLAIR McCLURE, M.R.C.S., L.R.C.P.,
D.P.H., Lond., etc.
Assistant to Medical Officer of Health, Manchester.

IN the absence of the Medical Officer of Health, information was received at the Public Health Office on Monday, October 14th, 1912, that a number of cases of food poisoning had occurred in the practice of several medical men.

Further inquiries revealed the fact that 163 persons were affected. All these persons, excepting five children, had eaten meat purchased from the same shop on either October 11th or 12th. With the exception of these five children, who were all under the age of 13 months, persons who did not partake of this food were not ill.

Particulars of other meals taken by the families concerned were obtained, but there was no evidence implicating association of any other food with the subsequent illness.

The nature of the incriminated food was as follows:—

Pig's Belly, which consists of the stomach and large gut of the pig, accounted for	...	55 cases.
Pig's Shoulder, accounted for	...	34 "
Pig's Leg	"	18 "
Pig's Cheek	"	18 "
Pig's Feet	"	11 "
Savoury Duck	"	10 "
Sausages	"	7 "
Other Food	"	10 "

"Other Food" includes pig's tail, ribs, brawn, pork pies, pig's head and blackpudding.

All this meat, with the exception of the pig's cheek and feet, was bought by the retailer on October 11th. The pig's cheek was bought a week previously and the feet about two weeks before and kept in brine.

As far as could be ascertained by house to house inquiry, 401 persons ate meat bought from this shop on October 11th and 12th, and 163, or about 41 per cent., were subsequently taken ill.

Taking each variety of food separately:—

Pig's Belly was eaten by 69 persons, of whom 55, or about 80 per cent., were ill.
Pig's Cheek was eaten by 27 persons, of whom 18, or about 67 per cent., were ill.
Pig's Feet was eaten by 24 persons, of whom 11, or about 46 per cent., were ill.
Boiled Shoulder was eaten by 52 persons, of whom 34, or about 66 per cent., were ill.
Roast Leg was eaten by 82 persons, of whom 18, or about 22 per cent., were ill.
Savoury Duck was eaten by 26 persons, of whom 10, or about 38 per cent., were ill.
Sausages were eaten by 47 persons, of whom 7, or about 15 per cent., were ill.
Other Food was eaten by 74 persons, of whom 10, or about 13 per cent., were ill.

*Read at a Meeting of the North-Western Branch on 21st February, 1913.

ADMINISTRATION OF SANATORIUM BENEFIT IN TOWNS.*

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

THE whole ideal scheme of the Government for the administration of sanatorium benefit has been so fully set out in the Astor Report and subsequent memoranda of the Local Government Board, that it seems hardly necessary to repeat its description as a preamble to the discussion of its details. Still, as it is obviously better to say too much than too little in dealing with a matter of such importance as this, I shall risk the reproach of redundancy by considering very briefly the whole armamentarium of prevention and treatment while offering suggestions for its application to the special needs of towns and cities.

The heart of the scheme is the dispensary, which is at once a head office, a clearing house, a diagnosis and treatment centre, an information and an instruction bureau for the entire movement.

The area and population to be served by each dispensary in town districts has been variously stated, but the Local Government Board memorandum of May 14th, 1912, suggested 150,000 to 200,000 as the population figure for each town dispensary in the immediate future. While centralization in the administrative department necessarily makes alike for economy and efficiency, the fact must not be lost sight of, that, even with the best modern means of communication, it is undesirable in a large proportion of cases to call upon the patients to travel long distances. In a town like Nottingham, with a population of 265,000, and a long diameter of more than seven miles, we have started with one central dispensary, but in all probability branch establishments will ultimately be called for.† The experience of schools for mothers and school clinics in this connection all points to such a conclusion.

As regards accommodation and equipment, the appended description of what has been found necessary at our own central dispensary will serve as an example of minimum requirements.

This dispensary is for the service of the city only. At the outset, in deference to the

suggestion of various authoritative reports and memoranda on the subject, the question of union with the county or other outside body or bodies was considered, but the ultimate decision, on the part of practically all persons consulted, and in the interests of all parties concerned, was unfavourable to such amalgamation. It was felt that administrative difficulties would constitute an almost insuperable bar to the possibility of such union.

The Central Dispensary building consists of a house of 13 rooms, utilized as follows:—One room as an office, one as a committee room, one as a waiting-room, two as consulting-rooms, two as dressing-rooms (one each for either sex), one as (drug) dispensary, one as a laboratory and laryngoscopic room. The four remaining rooms may serve for the residential accommodation of one or two nurses and one servant.

The fitting and furnishing of such a house for the purpose of a dispensary, as above described, can, with very strict economy, be carried out in sufficient completeness at any rate to render it reasonably efficient, at a cost of £500, and, according to the Departmental Committee's Report (pages 26 and 27), £400, or four-fifths of this, should be obtainable from the Treasury, leaving £100 only to be provided from the local rates. So much for capital outlay.

The staff consists, or is to consist, of the tuberculosis officer, one assistant, to serve a clerk, dispenser, and occasional bacteriologist one dispensary nurse and two visiting nurses. It should be noted that the major part of the bacteriological work required will be done by the City Bacteriologist and Pathologist, who has a well-equipped laboratory provided by and connected with the Health Department. This is a brief description in outline of the dispensary as an isolated unit.

Inasmuch, however, as the clinical section of the curative and preventive work must necessarily go hand in hand with public health and housing reform, if the new department is to fulfil itself satisfactorily, it is, to say the least, highly desirable that the dispensary administration should be closely linked up with the Health and Housing Departments. This union, or co-ordination, should be a matter of definite arrangement from the outset, and there is obviously one official in whose person and office the union should be centred, and that is the medical officer of health.

The tuberculosis dispensary and the sanatorium, to be presently described, are provided

by the Health Department, and, in our city, in order to emphasize the necessity for union between the several municipal agencies operating to improve the public health, and to afford the greatest possible facility for co-operation between the Health and Housing Departments and the new Tuberculosis Department, the tuberculosis officer has been appointed also the deputy medical officer of health. As the headship of all sections of the Health and Housing Departments is vested in the medical officer of health, this arrangement will enable the tuberculosis officer to deal directly with any health or housing matters requiring attention which may come to his cognizance, directly, through the office of the medical officer of health; including, *inter alia*, such matters as those connected with the supervision of milk and other foods.

A few words now as to the relation of the local Insurance Committee to the scheme. No binding agreement at present exists between the Corporation and the local Insurance Committee, but the latter have practically undertaken to administer sanatorium benefit exclusively by the agency of the local authority, and in pursuance of this undertaking the scheme set out in this paper has been organized.

The tuberculosis officer, appointed and paid by the Corporation and acting as expert adviser to the Insurance Committee, serves as the official personal link between these two bodies.

Owing to the official approval of such an arrangement as here described between the local Insurance Committee and the Local Authority already given by the Local Government Board, and the obvious advantage of it so far at least as the majority of our towns and cities are concerned, I shall here presume it to be the generally accepted order, and make no reference to possible alternative arrangements of a less convenient character.

No patients from outside the City of Nottingham have hitherto been admitted to the City Sanatorium, nor is the admission of such patients at present in contemplation. All available space in the sanatorium is likely to be required in the near future for Nottingham patients. I may mention, however, that several outside authorities have applied for beds.

I shall next proceed to discuss very shortly the routine practice and work of the tuberculosis officer and his staff, but must premise that certain details of work here described, though definitely contemplated, are not yet in actual operation.

Every case of tuberculosis, or reputed tuberculosis, brought to the notice of the department is visited by one of the outside nurses or inspectors, who takes notes of the following matters:—The situation, the size, the rental, and the sanitary condition of the house in which the patient is domiciled, the number of inmates, their ages and sex and relations to one another, their state of health, present and past, and the amount of money per week earned by the members of the family group to which the patient belongs or otherwise reaching the family coffers. The visiting nurses carry with them note-books, in which these particulars respecting the houses and persons are entered, and from which they are transferred to separate sheets (one for each patient and his family unit), daily, at the dispensary. Any sanitary defect or other kindred matter discovered in the course of these visits is reported to the appropriate department.

If the patient has not a medical attendant he is at once examined at his own house, or the dispensary, and a full description of his case entered up in the class to which the latter is held to belong, together with a note of the line of treatment to be adopted for him—*e.g.*, whether his case be medical or surgical in character, whether domiciliary, dispensary, hospital or sanatorium treatment is called for.

With regard to observation beds, it was at first intended to establish these at the dispensary, but, in the interests alike of the patients and the administration, it was ultimately decided to place them at the sanatorium, and this arrangement I have no doubt will be adopted elsewhere whenever the sanatorium is properly equipped and conveniently situated.

Tuberculin treatment, moreover, is now almost exclusively given at the sanatorium, where the patients, of course, are under continual medical supervision. I need not explain the advantage of this arrangement as compared with home treatment of the same description. If a medical man is in charge of the case, a stereotyped letter is sent to him reminding him of the lines of treatment appropriate to different types of cases which are available under the new régime, and offering the services of the dispensary staff in promoting the efficacy of domiciliary treatment.

Shelters, to be used by patients undergoing dispensary and domiciliary treatment, will be provided by the Corporation under an arrangement with the Insurance Committee, but in

* Read before a Meeting of the Society of Medical Officers of Health, on 11th April, 1913.

† I may mention here the projected incorporation of the Mothers' and Babies' Welcomes in the dispensary scheme. It is now proposed to use these Welcomes as branch dispensaries, especially for the examination, sorting, and treatment of children suffering, or reputed to be suffering, from tuberculosis, who are resident in the neighbourhood of these institutions.

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towns there must obviously be less scope for the advantageous use of such shelters than in rural areas.

Systematic disinfection of all houses known to contain phthisical patients is carried out by the Health Department, in all cases where consent can be obtained, as far as possible at regular and frequent intervals.

I may here perhaps be allowed to indulge in a brief parenthesis on domiciliary treatment. Owing to the importance this treatment is almost certain to assume under the existing arrangements by which a pool of sixpence per head of insured persons is provided for the payment of general practitioners on the local panels undertaking such treatment, I feel constrained to point out, in the first place, that it certainly cannot be undertaken with any advantage to the patients in a large proportion of the working-class dwellings of our modern towns; and, in the second, that, even under the most favourable conditions, it will be liable to degenerate into a perfunctory and purely nominal supervision in a large proportion of cases, unless the services of the dispensary staff are requisitioned to see that the patients and their friends understand and put into practice the principles of sound curative and preventive treatment.

Now with regard to sanatoria. The Local Government Board, in their memorandum of the 14th May, 1912, tentatively estimated that about one bed per 5,000 of the population would be required for sanatorium accommodation proper, and another like amount for hospital accommodation—this for the guidance of local authorities in endeavouring to estimate the amount of accommodation to be provided under the new régime. The sanatorium at Nottingham, which has been in existence for several years, will serve as the type of a large class of such institutions attached to municipal hospitals in all parts of this country, and may therefore be described as embodying the approximate requirements of towns like our own at the present stage of the anti-tuberculosis crusade.

It consists of one 30-bed wooden block, two and 12-bed iron blocks, and some large sheltered and adapted farm buildings, containing altogether about 20 beds. These buildings are furnished with verandahs, and generally equipped for convenient use as open-air hospitals or sanatoria for both sexes. Owing to the character and arrangement of the buildings, it is possible to separate cases of different

types, and stages from one another, which is frequently of great advantage. The whole sanatorium stands in open country, apart by itself, but within the general isolation hospital enclosure of 12½ acres, at a distance of about three miles northward from the centre of the city. The hospital enclosure has in its immediate vicinity a large area of agricultural land belonging to the Corporation, suitable for cultivation by convalescent phthisical patients, and upon which also further sanatorium buildings can be erected. Thirty shillings a week is paid by the Insurance Committee for each patient sent in by that body. Until July 15th, 1912, when sanatorium benefit under the National Health Insurance Act came into operation, phthisical patients were admitted only on payment of 10s. 6d. a week per head, and, pending the final settlement of the proportional amount of the total cost of providing sanatorium treatment for uninsured persons to be borne by the Treasury, this arrangement continues for the uninsured desiring to enter the institution. Exercise and employment is provided to some extent upon the agricultural land surrounding the hospital and sanatorium, for those in fit condition to work; but the insured patients up to the present have not, as a rule, proved so industrious as those admitted under the old régime. The insured patients appear to regard themselves as State pensioners on holiday, and to consider all work an evil to be avoided as far as possible. Up to the present, moreover, the Insurance Committee's patients have been sent in only for periods too short to be of permanent advantage to them.

In my first report upon the organisation of the Dispensary and Sanatorium Scheme under the new Insurance Act, furnished to the Local Government Board in the early part of 1912, I recommended the inclusion of the tuberculosis ward of the General Hospital as part of the Sanatorium Unit for the accommodation of cases requiring active surgical treatment, and in the first instance this suggestion met with a favourable reception at the hands of the hospital authorities, especially in view of the fact that such affiliation was to carry with it a payment of 10s. a week for each patient admitted; but in the end the proposal was rejected on the ground that its acceptance would involve the sacrifice in some measure of the hospital's independence, together with a risk of diminishing its revenue from voluntary contributions. Under existing conditions, therefore, insured and uninsured

cases of tuberculosis requiring such surgical treatment as cannot conveniently be given at home or at the dispensary or sanatorium must be sent to the General Hospital, as heretofore, with in-patient letters.

No scheme of this character can be considered complete without a hospital for advanced cases, a farm colony, and an open-air school for tuberculous children; but in most towns at the present juncture, with a demand on the one hand from the Local Government Board for the adequate treatment of insured and uninsured alike, coupled with an offer of half the total cost of dealing with the latter from the Imperial Treasury, and on the other hand a strong desire on the part of local authorities to obtain a larger subsidy than this if possible, there is an unmistakable tendency to go slow so far as all new developments are concerned, until these authorities know definitely what they can be compelled to do, and how much of the total cost of what—at the lowest estimate—must be a very large and expensive undertaking they can obtain from an unwilling Exchequer.

ADMINISTRATION OF SANATORIUM BENEFIT IN COUNTIES.

DR. EUSTACE HILL (Durham C.C.) said that Dr. Boobbyer had been dealing with a scheme in being, while a county scheme with which he proposed to deal, was one *in posse*, and therefore it was difficult to dogmatise too much as to the best methods. It might be taken for granted that the proper body to carry out the administration of sanatorium benefit was the county authority, not the Insurance Committee, or other small bodies. Any scheme for either county or borough should deal with all cases of tuberculosis whether insured or un-insured. In the county area that would be more difficult as the county council was not the executive sanitary authority—that being in the hands of the county boroughs and district councils. There was also an increased difficulty in acquiring hospital accommodation. In addition a much larger number of dispensaries and local hospitals were required than was necessary in a borough. It was not his purpose to go into the principles of the report of the Departmental Committee. The same units were required in a county as for an urban area—dispensaries, hospitals, sanatoria. Before carrying out a scheme an agreement should be made with the Insurance Committee that they would utilise the accommodation provided by the county authority. That was a matter of prime importance. It was also desirable that the County Insurance Committee should make themselves responsible not only for insured persons, but for their

dependents. Up to 1915 it would be impossible for the Insurance Committee of large counties to expend the benefit fund for the treatment of insured persons. If they undertook to treat dependents as well as insured persons, it was manifest that the cost to the county would be reduced. It was very desirable that there should be representatives of the County Insurance Committee on the County Health and Tuberculosis Committee; in fact, everything should be done to cause co-operation between the two bodies. A certain number of the Insurance Committee should be asked to attend the meetings of the County Tuberculosis Committee and make themselves acquainted with the progress of the scheme, and report to their own committee. As the result of considerable experience in this matter, he suggested that the County Sanitary and Tuberculosis Committee should be independent of the Health Committee. The question arose as to combination between counties and county boroughs for joint schemes. There were, in his opinion, objections to that. These were: There was undoubtedly delay wherever there were joint committees; in addition, it was strongly held by his own county that there was no control over expenditure. Probably it might be desirable in less populous counties that there should be co-operation in joint dispensaries and sanatoria, and the arrangement should be, payment for services rendered rather than by a joint scheme. In large counties, such as the West Riding, it was most undesirable that the county medical officer should be the tuberculosis officer. It was utterly impossible for a county medical officer to perform his own necessary duties and those of the tuberculosis officer. In small counties a different arrangement might be made for clinical purposes. The adviser of the Insurance Committee should be the tuberculosis officer. The most essential point was that the dispensaries should be sufficiently numerous to avoid unnecessary cost of travelling any distance; but that there should be one dispensary for every 150 or 200 of the population was quite untenable. In each dispensary there should be four or five rooms—a consulting room, a laboratory, a waiting room, and nursing accommodation. The proposal of the Local Government Board that the cost up to a maximum of £240 should be agreed to; but his own view was that £240 would be practically required in every case. In his own county sixteen dispensaries were provided. It was better, in his opinion, instead of building or buying them, they should be rented, and his estimate was that a sufficient number could be obtained at an average rental of £30 a year. In that case there would be no capital expenditure charges. The rent would be chargeable to maintenance, and 50 per cent. of that would be defrayed by the Local Government Board. What

they had been able to do in Durham—and that might be applied in large towns—was to obtain the use of dispensaries attached to hospitals, for which they paid a comparatively small rent; in Darlington the rent was £40 a year, while they had obtained another near Durham almost free except for the payment of working expenses. A question arose as to whether the larger dispensaries should have observation beds attached. That meant resident nurses, and he had been rather in favour of it, but had found it was going to be rather an expensive business. It was better that the observation beds should be included in the local hospitals where there was a staff available. The size of the staff depended very largely on the population to be dealt with. A whole-time assistant tuberculosis officer was desirable, and his salary should be at least £300 a year, with travelling expenses. This assistant should work under the tuberculosis officer, and his duties should include attendance at the dispensary, filling up forms, consultation with the officer as to the treatment of patients, etc. In addition it was necessary to have a number of tuberculosis nurses in any county scheme. Their duties were fairly obvious, but the question was whether they should be confined entirely to tuberculosis work. His own view was that they should also act in the administration of the Notification of Births and Defective School Children Acts. That would prevent overlapping. It was likewise very important that the assistant tuberculosis officer should aid the district officer of health in carrying out the tuberculosis regulation. The co-operation of district authorities was essential in other ways as regards the disinfection of infected houses, the provision of sputum flasks, and paper handkerchiefs, etc., but they should be expected to provide shelters which should be loaned by the county council. It would be found, he thought, that general practitioners would agree that their patients should not be treated at the dispensaries, nor examined domiciliary. As to hospitals, these should be local, and existing buildings should be utilised. They should be rented and not purchased. Isolation and smallpox hospitals could readily be made use of. Hospital boards should be asked to provide tuberculosis pavilions on a site separate from their isolation and other pavilions. Repayment of the capital expenditure could be provided for by a rent spread over a period of 30 years, at the end of which time the buildings would become the property of the authority, and when it was to be hoped provision for the treatment of tuberculosis would not be so necessarily great as at present. Care would have to be taken, however, with regard to the use of smallpox hospitals, because in the event of a smallpox epidemic the tuberculosis patients would have to

vacate them. A supply of motor ambulances would be useful. As to the area of land for sanatoria, the Local Government Board laid it down that half an acre was advisable for each patient. In the county of Durham they had secured for their sanatorium a site of 400 acres. The Board advised that apart from the administrative block, the pavilion could be built at a cost of £50 a bed. The central sanatorium should be reserved for acute and early cases, the advanced cases to be treated in the other sanatoria. Children should be dealt with by the education authority. Finance had been the great stumbling block. That was dependent on the grants obtained from the Insurance Committee, and on the number of hospitals and beds required. In the county of Durham they had had no difficulty in coming to an arrangement with the Insurance Committee for the treatment of insured persons and their dependents, and they would practically be able to get the whole of the Sanatorium Benefit Fund, so that up to 1915 there should be very little charge on the county authority. Once the county scheme was complete the cost would be between a halfpenny and a penny in the £ of the county rate. In the county of Durham a penny rate yielded £9,000, which, after paying all expenses, left a considerable margin to play with.

DISCUSSION.

DR. J. R. KAYE (West Riding, Yorks) thought the general discussion should be adjourned to another meeting, but in the meantime he would refer to Dr. Boobbyer's suggestion as to the use of smallpox hospitals for sanatoria. In the West Riding they had 50 smallpox hospitals, and they were trying to get rid of some of them. Dr. Hill had said that the sanatoria for the treatment of early cases should have an extent of land equal to half-an-acre per patient, but he did not know if the Local Government Board would agree to that. In the administration of sanatorium benefit the Public Health Committee ought to be the pivot of all the work. In the West Riding the Public Health Committee co-ordinated very well with the Tuberculosis Committee. As to observation beds, they had in the West Riding 30 dispensaries, and in 10 of the principal ones there were observation beds. They were not building new dispensaries, but utilising old houses. In those with observation beds they could accommodate two nurses and another attendant. In the West Riding they bought 145 acres of land which were set aside for acute and advanced cases of tuberculosis, 30 acres for children's cases, and 20 acres for workmen's houses. They had four sanatoria going, with 50 patients, and a good number of the men were quite willing to work. He was astonished to hear that Dr. Boobbyer had found the men rather shy at work because they had got

them to work as part of the treatment, and they now did it willingly. He thought there would be difficulty in setting aside purely isolation cases. He thought there should be a dispensary every three or four miles. In the West Riding they had divided their area into 30 districts, with a dispensary in each. They had seven tuberculosis officers who were held out as experts, and patients came to them like pilgrims going to a holy well. It was absolutely necessary that the dispensary nurses should be thoroughly trained, and be able to work in association with the health visitor and the school visitor, and be very discreet with the patients. The dispensary should be absolutely free, and he agreed that wherever they could there should be joint dispensaries. They had done that in the West Riding.

At this point the meeting was adjourned.

The adjourned discussion was resumed on Friday, April 25th, when Dr. W. G. Willoughby, Vice-President, in the unavoidable absence of Professor E. W. Hope, President, occupied the chair.

The Hon. Secretary, DR. HERBERT JONES, announced letters of apology for inability to be present from Dr. P. Boobbyer and Dr. Eustace Hill.

DR. S. C. LAWRENCE (Edmonton) said he wished to deal with the subject of debate from the point of view of an urban district with a population of 67,000. He had listened to the speeches the other day with great interest, but must candidly say that the remarks of Dr. Boobbyer, interesting as they were, did not appeal to him in his official capacity, because that gentleman's organization did not fit in with the views of a small sanitary authority. This problem was altogether a different one from that of the ordinary county medical officer, and a much easier one. He was sorry for the medical officer who had fifty or sixty districts to deal with; there might be possibly points of friction. Everyone would agree that they wanted the sanatorium scheme to succeed on the broad general ground that the treatment of disease should be properly and systematically dealt with. It was when they came to methods that they differed. The only way they could deal with it in a county area was by co-operation between their officers and the officers of the urban district. In the letter addressed by the Local Government Board to the different local authorities they were at particular pains to express the hope that the county councils would give effect to the recommendation in the L.G.B. circular of December 6th last, as to co-operation with the central authority. He had had the pleasure of studying certain county schemes, and in one or two of them he had been irritated with the references to the local authorities and their medical officers. Their standard was that the medical

officers were shockingly ignorant, and had much to learn. His reply to that was that some of them with their committees had been at work on tuberculosis for the last thirteen or fourteen years. In his own case they had been at work since 1904. It was a pity to take as a first postulate that all the urban districts were ignorant on the subject, and should be brought up on the bottle. (Laughter.) They were thoroughly acquainted with the subject, and had taken measures to ameliorate the condition of tuberculosis patients and to prevent the spread of the disease. What was wanted was adjustment between the county medical officers and the practitioners, together with the tuberculosis officer. Differences of opinion would be sure to arise on the question of the sites of the head and branch dispensaries, and also on what was going to be done with the tuberculosis nurses. The opinion had spread that these nurses were going to act as district nurses. In his view they should not be nurses in the ordinary acceptance of the word. He had made the suggestion which he thought would promote harmony, that the tuberculosis nurses should be on the staff of the local authority of the district in which they were to work, and should be appointed and paid by them. That would lead to economy, because they could be appointed partly as tuberculosis nurses, partly as sanitary inspectors connected with the Public Health Committee, and partly in following up scholars. He did not think the county councils would object to that and pay part of the salary. The local authorities hinted that if the appointment of the nurses were left to the county council they would very likely appoint persons who had had an excellent experience as regards tuberculosis in particular, and pulmonary diseases in general; but they would not know the difference between a drain pipe and a donkey, and their report as to the sanitary condition of the houses would be worthless. If, however, their appointment were left to the district councils, these would see to it that the nurses had some knowledge of sanitary matters, and whose reports would have some effect on the medical officer of health of the area. He commended the following resolutions which had been recently passed by the Middlesex District Councils' Association, which was composed entirely of laymen:—“(a) The county council should be the organising authority in general. (b) The tuberculosis officers should be consultants only, and should not undertake treatment or any administrative work. (c) The local public health service in each district should be used to the fullest extent to prevent overlapping, friction, and unnecessary expense, and avoid the creation of a separate distinct public health authority for every disease.” When laymen passed such a resolution as that he thought it should be accepted.

DR. J. R. KAYE (West Riding, Yorks.) said it would be very difficult in an area like his own in the West Riding for the tuberculosis nurses being on the county staff. In thickly-populated parts, and at the head dispensary the tuberculosis nurse should be a superior person with special training. In the villages the nurse might also take the position of health visitor and school visitor. No doubt there would be difficulty as to the appointment and training of the nurses; but if the scheme was to be made successful there ought to be co-operation between the county and district councils and the Insurance Committee.

MR. F. E. FREMANTLE (Hertfordshire) said that on the question of the nurses, they in Hertfordshire were in a unique position which was very convenient. They were comparatively a wealthy county and the people in most of the villages were prepared to do a great deal of philanthropic work. They had got a county nursing association which federated forty village nursing associations. They took the nurses of these federated associations just as they were, whether they had been trained for three years or three months, and whether they were midwives or not. The idea was that they got in a large area, nurses appointed mainly on account of their sex, and who were intimately associated with the maids and mothers of the working classes, who knew their homes and their needs. They had made an arrangement with the county association by which these nurses looked after the children in the schools at the rate of 2d. a head. That was paving the way for getting nurses for tuberculosis cases as well as for other diseases. It was quite obvious that those ordinary district nurses could not be expected to have expert knowledge of tuberculosis, either curative or preventative; but if county tuberculosis nurses were appointed *ad hoc* were they to supplant the nurses in their own homes? If they did go into the homes of the people in addition to the district nurses there would be friction. The alternative was that the Insurance Committee should have nothing to do with these nurses. The only thing would be to take over the work of the district nurses, train these up into more or less efficient tuberculosis nurses, and use them for the purpose of insurance work. Dr. Lawrence had said that they could not separate curative from preventative work; because it would give rise to friction; but if they had highly-trained nurses for preventative work that would be setting up an opposition to the sanitary inspector of the district. The medical profession nurses were trained with reference to curative; it was only afterwards that they looked to preventative work; but there was a good opportunity, especially when the Nurses' Registration Bill now before Parliament, of securing that every nurse should be

preventative as well as curative work in connection with diseases, so that they would have in time a nurse in each village for all purposes for which a nurse is required who would not interfere with the doctor, a woman who would act as a link between the household and the sanitary inspector. In his county the nurses at the county dispensaries were under the orders of the tuberculosis officer, but were still the servants of the County Nursing Association, which was responsible for financial and disciplinary duties. Dr. Lawrence had raised a most important question as to the position of county and district authorities. His own view was that the local sanitary authority was essentially the preventative authority, and that they should give them all the support they could in their work; but they could not divide the dealing with tuberculosis and other diseases and sanitary work. The great difficulty was the payment by different authorities which was not desirable, nor did he think workable. Here was a possible and therefore a reasonable and logical division between the tuberculosis and sanitary authorities. Tuberculosis was essentially a curative work, and it was as a curative work that it must be carried out, while preventative work must take a back seat.

DR. CORFIELD, Colchester, said that in Essex the difficulty was as to how the nursing was to be done. The tuberculosis preventative work was being done by the health visitor, who worked under the local authority; but the difficulty arose when the health visitor was not a trained nurse. A health visitor could visit a great number of cases in the course of a day, but a great many of the cases would probably need actual nursing though not from a preventative point of view. In small rural districts it might be possible for the local health visitor to combine her duties with nursing treatment.

The Chairman (DR. W. G. WILLOUGHBY, Eastbourne) said that in his district there was a sentimental objection on the part of parents to have nurses who had to do with visiting school children, and also to deal with tuberculosis patients. Accordingly separate nurses had to be appointed for these duties. However, he had found it was perfectly possible to get a nurse trained to do the work very well in both in a sanatorium

cases. DR. DILANDS (Kensington) said that in the borough of Kensington there were two kinds of nurses, a system which had been in force for two or three years. It led to friction and jealousy between the women who went to the homes of the people to report on their sanitary condition, and the dispensary nurses who were regarded with suspicion as not having had special sanitary training. He entirely agreed that this work should be done by one woman, that she should come from a dispensary, and that she should be

more or less under the control of the local medical officer of health. What he should like in the borough of Kensington would be to have the dispensary nurse a member of his staff. Any woman of ordinary common sense was perfectly able to report on the sanitary condition of the house.

DR. CALDWELL SMITH (Wandsworth) said that in his district, which had a population of 330,000, he believed he had solved the difficulty connected with sanatoria. They had started with two dispensaries, absolutely under the control of the local authority. He had three health visitors, the nurses, and the dispenser, who was trained to keep the records. In the dispensary they had a nurse who never made visits outside, but saw patients under the control of the health officer. All the visiting was done by the health visitors, who were qualified sanitary inspectors, and reported to him directly. The people themselves ought to be made to realise that to empty slops, make beds, and do other household sanitary work was not the duty of nurses. Bed-ridden patients ought to be looked after by their own medical men. In London they had Ranyard nurses, who took up true nursing duties. If each locality had its own dispensary under the control of the Public Health Department, there would be no friction except, perhaps, with regard to tuberculosis treatment. He hoped the county council would take up the question of the treatment of non-insured persons.

DR. FRANK ROBINSON (Cambridgeshire C.C.) said that it was the duty of the sanitary inspector to visit the houses of the people and report on their structural condition and as to whether that required to be remedied. Why should a nurse have anything to do with the structural defects of a house? In the county of Cambridge there was a strong movement on foot for the extension of nursing necessitated by the working of the Insurance Act. The question was raised whether district nurses should be utilised for all cases, or whether special nurses for tuberculosis patients should be appointed. There were very strong arguments on either side; but it would be probably cheaper to utilise the services of the district nurse in tuberculosis cases. Anyone with some experience of dispensary work would be able to settle that point. There was considerable possibility of friction arising between the usual medical attendant and the tuberculosis officers.

DR. HOWARD JONES (Newport, Mon.) said that in Wales and in the county of Monmouth a considerable difficulty had arisen from the fact that a large fund, which now amounted to £200,000, had been raised as a King Edward VII. Welsh National Memorial. The Memorial Committee had taken over the whole of the nursing work in

Wales and Monmouthshire from the county councils and the National Health Association. In this way another separate authority had been created against the advice of every medical officer in Wales. The money, however, had been too great a temptation to the local authorities. The medical officers had tried to do something to bring this scheme into working shape by co-ordination of the officers and the sanitary authorities. But the work was in the hands of people who had had no experience; and the administrative expenses came to £7,000 a year before any work was done. In fact, they were spending more than their income on officials.

The CHAIRMAN: Then you will soon have automatic extinction.

DR. HOWARD JONES: Unfortunately they have got a right to do it from every county council in Wales; but we are in a very hopeless condition.

DR. BYGOTT (West Suffolk) said that from an experience of a sanatorium in the Eastern Counties he believed that if these institutions were managed by the local authority there was some hope of pressure being brought to bear upon them; but if they were managed by other institutions the work would be done in a very slipshod way. In one county council a gentleman who was something of a judge objected to the presence of a sanatorium in his district because he had discovered that consumption had been taken to the Swiss Valleys by visitors! He himself had not been able to obtain any history of the spread of tuberculosis from a sanatorium, and he would like other members to give their experience on the point. What had to be remembered was that the county authorities had their place and the district authorities their place. In his district, in order to make financial arrangements workable, they had to come to an agreement with other authorities in order to make an area. The scheme suggested by Dr. Fremantle was very attractive, but it would lead to a low standard in the qualifications of the nurses.

DR. GERARD TAYLOR (Berkshire C.C.) said he agreed with Dr. Robinson. In Berkshire the arrangement was that the district medical officer of health should visit the premises of every notified case; that the tuberculosis officer should get into touch with the doctor who notified the case, and that, with his consent, they should have a consultation, or that the visits to the case should be made independently. In his county the tuberculosis officer had had no difficulty at all, and met the visiting medical officer in the most friendly spirit. In this way he kept in touch with contacts. As to the functions of the nurses, personally he thought that the tendency at the present time was to over-inspect. There was a certain inclination in some departments to think that one could not get on without having an inspector for every new

branch that came out. They had found it very convenient to have a school nurse separate from the nurse of the county association. There were several reasons for that. Some districts were not covered by the county nurses, and it was impossible to carry out certain kinds of work without friction arising with the parents. It was very important to keep the ratepayers in good humour on financial matters, and they had also to consider the point of view of the general practitioner, who was very suspicious about these new innovations, and felt that the ground was being cut from under his feet, and that the time might come when he would have nothing to do. He (Dr. Taylor) thought the less they did to raise that kind of trouble the better.

The HON. SECRETARY then read the following from the PRESIDENT (Prof. E. W. HOPE), who was unable to be present:—

At the adjourned discussion on the administration of sanatorium benefits it might be of interest to the meeting if an outline of the position in Liverpool were given, and I submit the following particulars:—

1. The medical officer of health is the tuberculosis officer, and also adviser on medical matter, to the Local Insurance Committee.

There are four tuberculosis officers appointed, the senior being designated acting tuberculosis officer and assistant medical officer of health.

2. A central dispensary in connection with the Liverpool Consumption Hospital is in full work, and two others have been determined upon; one of the two, in the south end of the city, will be in working order in a week or so. The branch dispensaries will be rented only.
3. The whole of Parkhill Hospital is at present devoted to tuberculosis; it contains 200 beds. In addition, there are 75 sanatorium beds at Fazakerley, and an additional sanatorium (250 beds) is about to be constructed there, where some 150 acres of land will be available.

By arrangement, the general hospitals supply some 20 beds each for non-pulmonary tuberculosis.

4. Children are provided for at—
 - (a) The Royal Liverpool Country Hospital for Children at Heswall.
 - (b) West Kirby.
 - (c) A further institution at Leasowe is contemplated.

5. Payment is made at the rate of 27s. 6d. per adult insured person, and 12s. 6d. for dependent children.

All arrangements have worked well, the Committees of the City Council and the Local Insurance Committee being in cordial accord.

With regard to the classification of patients, on no consideration would I advise that all the favourable cases should go to one institution, and all the dying ones to another. Such an arrangement, I am convinced, would be contrary to every interest.

Special measures directed against tuberculosis have been in operation for many years, measures which may be embraced under the term of "general sanitation"; but, in addition, special officers have been appointed to visit consumptives, special prints of instructions have been issued for their guidance, isolation provision in the city hospitals has been found, and a close association with the Consumption Hospital and general dispensaries has been in operation. All this has paved the way for the valuable amplifications which the Insurance Act has rendered possible.

The discussion having finished, the meeting adjourned.

ROYAL PATRONAGE FOR THE NATIONAL GAS CONGRESS.—At the Jubilee Dinner of the Institution of Gas Engineers on June 17th, the President (Sir Corbet Woodall, D.Sc.) announced that their Majesties the King and Queen had been graciously pleased to give their patronage to the National Gas Congress and Exhibition which will be held at Shepherd's Bush in October next. He was also able to add that the Congress was receiving the patronage of Her Royal Highness Princess Louise, Duchess of Argyll, whose warm support of the Coal Smoke Abatement movement as of all schemes having for their object betterment of the sanitary and social condition of the people, has been evidenced on so many former occasions. This Congress and Exhibition are being planned on broad, co-operative lines by the Gas Undertakings of the whole country, not for individual profit, but to demonstrate the service which the Gas Industry can render the public, in aiding to solve the problems of Smoke Nuisance, Domestic Service, and National Health. It is on these broad grounds that the enterprise has received the approval of their Majesties whose deep and practical interest in all sociological and industrial problems has won for them in a special degree the affectionate gratitude of the workers in every industry in the Kingdom.

FUMES FROM SPELTER WORKS.—At a meeting of the Swansea Rural District Council recently Dr. E. Rice Morgan, medical officer of health, referring to poison-laden fumes emitted from a local spelter works, said every day procrastination by the authority was becoming a more serious matter, for the people in Llansamlet lost practically all their vegetables, etc., in their gardens last year owing to the fumes, and, further, animals grazing in the fields were in danger of lead and arsenic poisoning.

PERCHLORIDE OF IRON IN RING-WORM OF THE SCALP.

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

I SHOULD like school medical officers to try this remedy, which has yielded me very successful results as compared with other applications. The ringworm that obstinately resisted a strong solution of iodine, strong nitrate of mercury ointment, and acetic acid and formalin was cured completely and in a short time by the application of Liquor Ferri Perchloridi Fortior, B.P., the difference in the effect being very marked from the outset, so as to appear quite specific in the case of the iron perchloride.

The affected head having been subjected to a preliminary wash, or cleansing with petrol on pledgets of common tow, the solution of perchloride of iron is applied to the affected parts by means of a camel's hair brush until the skin is well stained with it, *i.e.*, apply copiously. The application should be repeated with regularity every two or three days for three or four weeks. I doubt whether any case of ringworm will be found to withstand ten applications of the stronger pharmacopœia solution of perchloride of iron made within four weeks.

If there be any considerable matting of iron and sebaceous secretion this should be occasionally removed, but it is not advisable to wash the head often, as the iron preparation is extremely soluble and easily washed away.

Some scalps are much more sensitive than others, and whilst in many instances there appears to be no pain caused by this application, other children cry on account of burning or smarting. Such children must be dealt with circumspectly, some hours being allowed to intervene between washing, or cleansing the scalp with petrol, and putting on the iron. In no case will any harm result either to the scalp or to the hair by the most liberal application, and the healthy parts of the scalp can be given a dressing between the hair roots as a matter of prophylaxis. Provided the applications be regularly made, children can continue to go to school, as there is no likelihood of spread by contagion during this treatment.

WHITE GLOVES FOR THE MEDICAL OFFICER OF HEALTH.—It is customary to present white gloves to judges and magistrates to denote the absence of crime, but the district council of St. Asaph has established a precedent by presenting a pair of white gloves to its medical officer of health, who had no report to submit because there was no disease in the district.

STATISTICS OF CASES OF INFECTIOUS DISEASE IN ENGLAND AND WALES IN 1912.

DR. NEWSHOLME'S annual statement of statistics of cases of infectious disease notified in England and Wales in 1912 has been published, and we learn thereby that the number of cases of pulmonary tuberculosis notified was 110,551; of smallpox, 111; of typhus, 31; of scarlet fever, 107,477; of diphtheria, 44,687; of enteric fever, 8,262; together with 2,184 cases of puerperal fever; 22,865 of erysipelas and one of plague. A useful table shows the number of cases of scarlet fever, diphtheria and enteric fever notified in each week, and where the cases exceed in any week by 30 per cent. the mean for the whole year, the figures are printed in leaded type. We miss, however, the interesting chart which accompanied the annual statement for 1911. The figures show the usual autumnal increase of these diseases and the diminution in the latter part of July and in August of the cases of scarlet fever and diphtheria, due no doubt to the closure of the schools at this period. A valuable addition to the report is a "Sketch of the occurrences of smallpox abroad during 1912," by Dr. R. Bruce Low, and a preliminary statement as to occurrences of plague and cholera throughout the world during 1912, by the same writer. Smallpox is evidently wide-spread in Europe, occurring especially in countries where vaccination is neglected, and in connection with the statements in our article on "Warfare and Smallpox," which appeared in the February number of PUBLIC HEALTH, it is interesting to read that "Smallpox has been prevalent in Constantinople during the whole of 1912, but that in the latter part of the year the prevalence became more acute owing to the influx of strangers, troops from Asia Minor on their way to the seat of war, and refugees from Thrace and Macedonia fleeing before the advancing Bulgarian invaders," also that smallpox had appeared in Salonica, and that of cases of smallpox among Mohammedan immigrants arriving at Trieste some were of the hæmorrhagic type. The smallpox of North America is said to be generally of a benign form, yet in certain localities it assumed greatly increased virulence, sometimes becoming of the hæmorrhagic type.*

In the pages devoted to Dr. R. Bruce Low's account of the distribution of plague, we note that this disease has continued in epidemic form in various parts of Asia and that as many as 322,000 persons were attacked in India in 1912. Nearer home plague has manifested itself in a number of localities in Africa, and in Egypt 884 cases were recorded in 1912. Except in Russia but few cases appeared in Europe.

*In the Public Health Reports for February, issued by the United States Public Health Service, we read that outbreaks of the virulent type of smallpox have recently occurred in California, Texas, Oklahoma and Pennsylvania.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856. RECONSTRUCTED 1888.
INCORPORATED 1892.

Metropolitan Branch.—A meeting of this Branch was held on Friday, May 23rd, 1913, at 1, Upper Montague Street, Russell Square, W.C., at 4 p.m. Present: Dr. Annis (in the chair), Drs. Allan, Bond, Eastes (visitor), Lennane, Parkes, Patrick, Caldwell Smith, Spaull, D. L. Thomas, and Charles Porter, Hon. Sec. Dr. Eastes read a paper on "The Milk and Dairies Bill from a Bacteriologist's Point of View," and directed attention to various defects and certain points of importance in relation to the bacteriological examination of milk.

The paper called forth a considerable amount of discussion, in which all the members present took part.

At the close of the discussion Dr. Eastes replied, and, on the motion of the President, a vote of thanks was accorded to him for reading his paper.

Southern Branch.—A meeting of the Branch was held at the York Hotel, Ryde, Isle of Wight, on Friday, June 6th.—There were present: Dr. J. A. Gibson (president), Drs. Willoughby, Forbes, Wilshaw, Jackson, Norman, Hutt and Fraser (hon. sec.).

The minutes of the last meeting were read and confirmed.

Letters of apology for absence were read from Drs. Lauder, Lyster, Stott, Goodwin, Griffith, Stephens, Livingstone, Hoyle, Maples, Butcher, Hawkins, Cameron, Milburn and Walker.

The action of the Brighton Division of the British Medical Association in regard to Dr. Forbes, M.O.H., Brighton, was further considered, and it was decided that for the present no further action be taken by the Southern Branch.

The Presidential Address on "The Progress of Sanitary Science and Anomalies of the Present Sanitary Service" was then read by Dr. Gibson, to whom a hearty vote of thanks was accorded. Members were very hospitably entertained to luncheon by the President at the close of the meeting and subsequently proceeded in motors to visit the Royal Naval College and the Convalescent Home for Officers of the Navy and Army at Osborne. Members were kindly shown over the former by Fleet-Surgeon Murray Jones, R.N., and over the latter by Colonel Wardrop, C.V.O. Colonel Wardrop also entertained the members to tea at Osborne House.

North-Western Branch.—Minutes of a meeting of the North-Western Branch of the Society

of Medical Officers of Health, held at the Town Hall, Chester, on Friday, June 20th, 1913. Present: Dr. Meredith Young (President) in the chair, Drs. Marsden, Burton, Corbin, Sergeant, Hamilton, Hitchon, McMaster, Ewing, Wynne, Berry, Fraser, Rennett, Webb, Vacher, Wilkinson, Banks, Daley, Stallybrass, Barlow (hon. sec.), and Mr. W. Thomson. Apologies for inability to be present were received from Drs. Garstang and Melville.

The minutes of the previous meeting were read and confirmed.

The following officers were elected for Session 1913-14:—*President*, Dr. H. H. I. Hitchon; *Treasurer*, Dr. A. B. McMaster; *Secretary*, Dr. T. W. N. Barlow; *Council Representatives*, Dr. H. H. I. Hitchon and Dr. Meredith Young; *Committee*, Drs. Granville Buckley, H. E. Corbin, J. W. Talent, and F. E. Wynne.

DR. BARLOW reported that the advertisement for an assistant tuberculosis officer for Wallasey, at a commencing salary of £350, rising to £500, had been refused insertion in the *British Medical Journal*. He read the correspondence between the Corporation's advertising agents and the secretary of the Association, and the following resolution was passed:—"That the facts and correspondence relating to the advertisement concerning the appointment of an assistant tuberculosis officer at Wallasey be brought to the notice of the next meeting of the Lancashire and Cheshire Branch of the British Medical Association."

The statement of accounts for the year shows a balance in hand of £9 17s. 7d., and treasurer (Dr. Hitchon), who will relinquish his office at the end of the session, was cordially thanked for his services.

A cordial vote of thanks to the Mayor and Corporation of Chester for the use of the Council Chamber was carried with acclamation.

After the business of the meeting was concluded, the members of the Branch, on the kind invitation of the President and Mrs. Young, adjourned to their home for tea, and afterwards went a short trip on the River Dee.

OBITUARY.

DR. ALFRED HENRY HAINES, for many years medical officer of health of Long Sutton, died suddenly in Kent recently.

DR. JOHN PENNY, medical officer of health of Cockermouth, died on June 20th, in his forty-eighth year.

DR. F. HALL REDWOOD, medical officer of health to the Rhymney District Council, died at his residence, The Lawn, Rhymney, on June 21st, at the age of seventy-four years.

LAW REPORTS. HIGH COURT OF JUSTICE.

CHANCERY DIVISION.

March 13th, 1913.

BEFORE SWINFEN EADY, J.

EARP v. BROWNHILLS URBAN DISTRICT COUNCIL.
River Pollution—Sewage Effluent—Breach of Injunction—Sequestration.

Mrs. Earp, the plaintiff, owner of the Shelfield estate, Staffordshire, obtained an injunction in October, 1911, against the defendant Council restraining them from sending sewage into the Ford Brook, which ran through her estate.

The defendants, in consequence, erected certain new works by which the sewage was raised by pumps to filter-beds. It was alleged that these were not sufficient and that the pollution still continued. The pumps were not kept going during the night, and in consequence it appeared that during wet weather sewage escaped into the brook. It was also stated by the consulting engineer to the defendant Council that owing to leakage of water from the subsoil into the sewer the calculations upon which the pumping capacity had been calculated were erroneous and bound to fail in prolonged wet weather. The plaintiff asked for a sequestration.

Swinfen Eady, J., allowed the motion to stand over to enable the Council to improve the works and remedy the evil, on the undertaking that the Council would keep the pumps working day and night.

KING'S BENCH DIVISION.

December 16th, 1912.

BEFORE ALVERSTONE, L.C.J., COLERIDGE AND ROWLATT, J.J.

MARSHALL v. SKETT.

Sale of Food and Drugs Acts—Milk—Deficiency of Fat—Milk as from Cow.

On proceedings against a farmer for selling milk to the prejudice of the purchaser not of the nature, substance and quality demanded, the justices cannot decline to convict on the ground that the milk had not been tampered with, if analysis shows the milk to be below the standard.

This was a case stated by the Justices of Birmingham on the hearing of an information charging the respondent Skett with selling milk on May 24th, 1912, to the prejudice of the purchaser, not of the nature, substance and quality demanded. Skett was a farmer, and sent a consignment of milk to a retailer in Birmingham. Marshall, the appellant, took a sample of the milk at the place of delivery. The sample on being analysed proved to be deficient in fat to the extent of 26 per cent.

The defence was that the milk had not been tampered with. In support of this, evidence was

given that another consignment of the same morning's milk from the same cows showed on analysis fat 3.1 per cent. (being in excess of the minimum). It was also proved that the morning's milk from the same cows a few days later showed on analysis a deficiency of fat just below the minimum.

The justices were of opinion that the milk was not of the nature, substance and quality demanded, but that the defendant had not tampered with the milk and that the milk was as it came from the cows. They therefore thought the defendant ought not to be convicted and dismissed the information.

The Court allowed the appeal.

LORD ALVERSTONE said that on the findings of the justices that the milk was not of the nature, substance and quality demanded they ought to have convicted, even although it was shown that the defendant had not tampered with the milk. The case must go back to the justices with a direction to convict, unless there was further evidence given bearing upon the question whether or not the difference between the quantities of fat in the two consignments was consistent with there having been ordinary milking.

COLERIDGE and ROWLATT, J.J., agreed.

March 4th., 20th., 1913.

BEFORE COLERIDGE, J., AND A SPECIAL JURY.

COINTAT v. MYHAM & SON.

Warranty of Food—Carcass of Pig—Condemnation as Tuberculous—Custom of Market—Damages—Remoteness—Loss of Trade.

This was an action to recover damages on the ground of breach of an implied warranty that the carcass of a pig bought by the plaintiff from the defendants was reasonably fit for human food.

The plaintiff was a butcher carrying on business in Westminster, and the defendants were meat salesmen at Smithfield Market. The plaintiff purchased from the defendants the carcass in question on November 23rd., 1911, and paid at the rate of 6d. per lb. for it, which was the highest price on that day. He exposed it for sale believing it to be sound and fit for human food. It was seized on the same day by one of the sanitary inspectors for the City of Westminster as being unfit for human food, and was condemned by a magistrate and destroyed. The plaintiff was subsequently fined £20 for having the carcass on his premises. He claimed to recover not only for the loss of the carcass and expenses he had been put to, but also for loss of business due to the injury, and his credit and reputation.

The substantial defence was that there was no implied warranty that the carcass was fit for human food, and evidence was called to show that in Smithfield Market there was no custom that meat sold there was impliedly or expressly warranted as being fit for human food or free from disease. It was further said that the plaintiff

himself inspected and selected the carcass and bid for it without any interference on the part of the defendants or their agents, and that he did not rely on their skill and judgment.

The plaintiff, however, in his evidence stated that he could not tell whether the pig was tuberculous or not, and judged it by its weight and fatness.

The following questions with their answers were left to the jury:—(1) Was the meat fit for sale as human food?—No. (2) Did the plaintiff impliedly make known to the defendant the purpose for which the goods were required?—Yes. (3) Did he do so in such a way as to show that he relied on the defendants' skill and judgment?—Yes. (4) Damages? (a) Excluding loss of business, £39 16s. 2d.; (b) for loss of business, £200.

Counsel for the defendants submitted that both classes of damage were too remote and could not be recovered.

COLERIDGE, J., took time to consider and gave judgment for the plaintiff for both sums found by the jury. He thought that the law was that damages were not too remote if they arose naturally out of the breach of the contract, and if the damages could fairly and reasonably be considered to have been in the contemplation of both parties as the probable result of the breach thereof, at the time of making it. He did not think that the damages arising out of the conviction were too remote.

After discussing various authorities, he said that where, as in this case, an article was supplied to a buyer to be used as food for his customers and that was known to the seller, and the article was supplied for that purpose, in the absence of negligence on the part of the buyer he thought he might recover for loss of custom due to the breach of the contract by the defendant, on the ground that the special loss was in fact actually in the contemplation, or might be taken to be in the contemplation, of the seller at the time of the making of the contract, as the reasonable consequences of such breach.

April 1st, 2nd, 1913.

BEFORE RIDLEY, AVORY, AND PICKFORD, J.J.
KERSHAW v. ALFRED J. SMITH & CO., LTD.

Metropolis Management Act, 1855—Sewer or Drain—Combined operation—Departure from—Subsequent reinstatement.

If Drainage by a combined operation has been sanctioned by a local authority, but the builder departs therefrom and so converts the drain into a sewer, the local authority can at a subsequent date on discovering the fact require the system to be reinstated in accordance with the approved plans and so reconvert the sewer into a drain for the repair of which the owner will be liable.

This was a case stated by one of the Metropolitan magistrates on the hearing of an information against Messrs. Smith & Co., for unlawfully neglecting to remedy a nuisance arising in connection with the drainage of his house, No. 178 High Road, Kilburn.

It was either proved or admitted that in 1884 the owner, who was also the builder, had applied for an order from the Vestry for the drainage of twelve houses by means of a combined operation as shown on a plan. The order sanctioning the system was made. According to the plan the houses were to be divided into two groups. One of these groups contained five houses including No. 178, and were to drain into a sewer in Eresby Road and the other group of seven houses into a sewer in the High Road. The builder departed from the plan and drained seven of the houses into the Eresby Road sewer. A drain from a workshop at the rear of No. 178 had also been connected without authority with the drain of that house.

The respondents, Messrs. Smith & Co., subsequently bought the premises No. 178, without notice that the drainage system was in contravention of the approved plan. In 1912, a notice was served by the Borough Council under Section 83 of the Metropolis Management Act, 1855, on the builder and original owner of the houses, requiring him to alter the drains so as to make them in accordance with the plan. He did not comply with the notice, and the local authority did the work. The authority then served on the respondents a notice under Section 85 of the above Act requiring them to remedy a nuisance caused by the combined drain at No. 178.

The defendants contended that the pipe question was a sewer, and not a drain, as the pipe under No. 178 drained more than one house and was not in accordance with a system of combined drainage as ordered by the Vestry. The magistrate, on the authority of *St. Leonard, Shoreditch Vestry v. Phelan* [1896], 1 Q.B., 533, decided in favour of this contention, holding that as the pipe had been a sewer it was always a sewer.

The Court allowed the appeal, Pickford, J., dissenting.

RIDLEY, J., said that the Shoreditch case could be distinguished, as in that case no question had arisen as to the effect of the notice under Section 83 of the Metropolis Management Act, 1855.

AVORY, J., agreed.

PICKFORD, J., dissented on the ground that the case was covered by the authority of the Shoreditch case.

April 3rd-4th, 1913.

BEFORE RIDLEY, PICKFORD AND AVORY, J.J.

BUTCHERS' HIDE, SKIN AND WOOL COMPANY, LTD.
v. SEACOME.

Public Health Acts, 1875 and 1907—Offensive Trade—Order of Local Authority—Carrying on Trade Established Before Order.

Section 51 of the Public Health Acts Amendment Act, 1907, is not retrospective. A person who establishes a trade which is afterwards made an offensive trade by order under that Section, commits no offence by subsequently carrying on the trade so established.

This was a case stated by the Justices of Gloucester upon the hearing of a complaint made by the respondent, the town clerk of Cheltenham. The complaint was made under Section 112 of the Public Health Act, 1875, and Section 51 of the Public Health Acts Amendment Act, 1907, and charged the appellants with unlawfully carrying on the business of a dealer in raw hides and skins. This class of business had been declared an offensive trade by an order of the local authority, confirmed by the Local Government Board, on May 17th, 1912.

The appellants in December, 1911, established and carried on without the knowledge of the local authority the business complained of, but it was not an offensive trade at that date, and they contended that the carrying on of a business which had been legally established before the order was not illegal after the order. The arguments turned on the wording of the Sections.

The Public Health Act, 1875, Section 112, provides: "Any person who, after the passing of this Act, establishes within the district of an urban authority, without their consent in writing, any offensive trade; that is to say, the trade of—blood boiler, or bone boiler, or fellmonger, or soap boiler, or tallow melter, or tripe boiler, or any other noxious or offensive trade, business, or manufacture, shall be liable to a penalty not exceeding fifty pounds in respect of the establishment thereof, and any person carrying on a business so established shall be liable to a penalty not exceeding forty shillings for every day on which the offence is continued, whether there has or has not been any conviction in respect of the establishment thereof."

The Public Health Acts Amendment Act, 1907, Section 51, provides: "(1) The words 'any other trade, business, or manufacture, which the local authority declare by order confirmed by the Local Government Board, and published in such manner as the Board direct, to be an offensive trade,' shall be substituted for the words 'any other noxious or offensive trade, business, or manufacture,' in Section 112 of the Public Health Act, 1875.

"(2) The local authority may make bye-laws with respect to any trade which is an offensive trade under Section 112 of the Public Health Act, 1875, as amended by this Act, whether established before or after the commencement of this Act, in order to prevent or diminish any noxious or injurious effects of the trade."

The justices found that the business had been started before the order was made declaring the trade of a dealer in raw hides and skins within the borough to be an offensive trade, but they thought that it was in the interest of the public to construe the provisions as meaning that it was an offence to carry on a trade which had been declared offensive, although previously established. They accordingly convicted, and fined the appellants £2 and 10s. costs.

The Court of King's Bench allowed the appeal and quashed the conviction.

RIDLEY, J., said the case turned on the meaning of the words "so established." The more natural meaning of the words was to say that the business is not established contrary to the Act, unless the local authority has already declared it by order to be an offensive trade. There was nothing in the natural meaning of the words to give the Section a retrospective effect. The appeal should therefore be allowed.

PICKFORD, J., agreed, and pointed out that if the opposite construction was adopted, it might cause hardship to a trader who, wishing to start a business, would properly consult the list of businesses declared to be offensive, and if he did not find his particular business included he could legally establish it in the district. If legally established he could subsequently carry it on. If he committed a nuisance he was liable to be indicted. The local authority could also make bye-laws under Section 51 regulating the carrying on of offensive trades, whether established before or after the Act came into operation, so that the public were not without protection.

AVORY, J., concurred.

May 8th, 1913.

BEFORE PHILLIMORE, BANKES AND AVORY, J.J.

JORDAN v. GAMBLE.

Rag Flock Act, 1911—Mattress—Remaking—Application of Act.

If a person has rag flock in his possession merely for the purpose of remaking or restuffing an article, he is not liable to be convicted under Section 1 of the Rag Flock Act, 1911, if the flock is not up to the prescribed standard of cleanliness.

This was a case stated by a Metropolitan magistrate on the hearing of an information under the Rag Flock Act, 1911. By Section 1 any person who sells, or has in his possession for sale, flock manufactured from rags "for the purpose of making any article of upholstery, cushions or bedding" commits an offence, unless the flock conforms to such standard of cleanliness as may be prescribed by regulations to be made by the Local Government Board.

The appellant was summoned under this Section. He set up as a defence that the flock was not in

his possession for the making of any of the above articles or bedding, but had been sent to him in a mattress which he was required to restuff or remake. He contended that such restuffing or remaking was not a making of an article of bedding within the meaning of the Act. The magistrate decided against this contention and fined the defendant.

The Divisional Court allowed the appeal, and quashed the conviction.

PHILLIMORE, J., said the appeal must be allowed. A man who pulled to pieces a manufactured article and then put it together again did not make it. In the trade he was said to "remake" it. He, however, confined his judgment to cases where a person took flock out of the cover and put it back without any addition. If more flock was added, or if the flock between the two mattresses was transposed, the position would be different.

BANKES and AVORY, J.J., concurred.

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THE TUBERCULOSIS ORDER OF 1913.

IN connection with the appointment of veterinary inspectors for the purpose of administration of the Tuberculosis Order of 1913, attention has been directed to the omission to bring those officers into proper relation with the department of the medical officer of health. It needs to be recollected that this Order is designed and made in the interest of the public health. In the circular letter which accompanies it the Secretary of the Board of Agriculture points out that, "As regards the possibility of the transmission of the disease from affected bovine animals to man, the Board are satisfied that it must be accepted as a fact that tuberculosis is transmissible by the agency of milk used for human consumption," and that, "In considering the question of tuberculosis in relation to animals, the fact that the disease is thus communicable to man has a material bearing on the measures to be adopted." There is, therefore, every reason for regarding the administration of the Order as one of the measures, and, indeed, an important measure, for reducing human disease. It would be well, therefore, if it were made the subject of a letter from the Local Government Board, giving guidance to local authorities as to the position which these officers should occupy in their health administration.

In recent years the duties which devolve upon medical officers of health have been largely increased. Included in their departments when they serve Education Authorities, is a considerable staff, some of its members possessing special knowledge of particular maladies, in all of which even a widely informed man cannot reasonably claim to be equally expert. This has never been deemed to be sufficient reason for not including them in the department of the medical officer of health.

In the same way we may urge that the special knowledge which the veterinary inspector

brings to his work, a knowledge which, in respect of animal diseases, must necessarily extend beyond that of the medical officer of health, does not make it unfit for him to be included in the department of that officer. In the interest of good administration, we may reasonably claim that this is his proper place in the taking of steps to prevent human infection by tuberculous milk. We may urge that there is nothing derogatory to him in his profession for him to be thus placed, and certainly no one would be more willing than the medical officer of health to treat with the utmost consideration a member of a learned and scientific profession so closely allied with his own.

If Mr. Burns' Bill became law, there would be especial reason for the closest alliance between the veterinary inspector and the medical officer of health. They would have to work together in the visits to the farms from which tuberculous milk is received. A third officer is also needed, for the milk must be examined by bacteriological methods. No one would suggest that the bacteriologist should not properly be included in the department of the medical officer of health, and the same view would be taken of the veterinary surgeon, who would act under the provisions of Mr. Burns' Bill. Under that Bill, in fact, the medical officer of health would be authorised to inspect the cattle in the farms, being accompanied, for the purpose of inspection by a veterinary inspector or some other properly qualified veterinary surgeon. Here the duty of inspection would be placed upon the medical officer of health, but he, of course, would rely upon the expert knowledge of the veterinary inspector in the diagnosis of tuberculous disease of the animals.

In the administration of a law in which both officers are engaged, it is obvious that one or other must be responsible for the administration, and hence we may claim that where human health is to be protected by administrative action it is right that the medical officer of health, who is at the head

of the Public Health Department, should be at the head of the whole administration, and be responsible to the local authority for its efficiency.

In the absence of guidance from a Government department it is possible that diverse views may be held and diverse action taken by local authorities, and hence we would welcome an expression of opinion by the Local Government Board, which would tend to promote the efficient working of the Tuberculosis Order.

HOW TO DIAGNOSE SMALLPOX.

WE are hearing of additional evidence of the tendency of smallpox to spread in different parts of the world. During recent weeks smallpox has become prevalent in Sydney, and here it is interesting to note that it does not appear to be attended by a high rate of mortality such as that which has been manifest in some parts of the world. The smallpox of Sydney is said to have been brought by ship from Vancouver, and if this be accurate it is not likely to be derived from an Eastern source, such as would spread as the result of the war in the Balkan Peninsula. As we said on a recent occasion, the disease sometimes manifests differences in mortality, and so also differences in appearance, which make the diagnosis of this malady frequently difficult. In addition to these circumstances we may remember that we are frequently not meeting smallpox in its natural form. Smallpox is modified by vaccination in infancy, and this modification adds to the variety in the appearances of the disease, often obscuring its more characteristic features. Hence the difficulty of its diagnosis is frequently very considerable.

The duty of diagnosis of this disease is, however, one of the most important and responsible of the duties which from time to time devolve upon the medical officer of health; upon the accuracy with which the question is determined whether a particular person is or is not suffering from smallpox may depend the existence of a wide-spread prevalence of the disease, involving loss of life and a great expense to the community.

It is therefore with much pleasure we welcome the publication of a small work, entitled "How to Diagnose Smallpox," from the pen of Dr. W. M. C. Wanklyn, whose experience as a diagnostician of this disease is a very exceptional one, inasmuch as this has been his duty as an officer of the Metropolitan

Asylums Board, and for a number of years as an officer of the London County Council.

In his earlier pages Dr. Wanklyn gives account of a series of outbreaks due to error in diagnosis of the initial case, this first patient being thought to be suffering from chicken-pox or measles, and hence the measures applicable to smallpox for the limitation of the disease not being put into operation. These illustrations of the way in which smallpox spreads from an unrecognised case of the disease serve to show how more accurate knowledge of the various appearances which smallpox presents would limit the prevalence of this disease which we experience from time to time.

In a subsequent chapter Dr. Wanklyn discusses "practical points in the method of examination." He insists that the subtleties of smallpox should always be borne in mind, that the whole surface of the body should be seen as much as possible in one view and in a good light, and he points out how a bath brings out a rash previously invisible. The claim for examination of the patient to be made under these circumstances and with these facilities indicates the need for removal to a public institution of doubtful cases in which smallpox is in question, for much of the difficulty of the medical officer of health is that he often has to see the patient in the first instance in a poor home, where light is inadequate and the employment of a bath is out of question.

Dr. Wanklyn then proceeds to discuss individual cases of smallpox considered with a view to diagnosis. This he does in conversational style, which brings out the points upon which he relies for determining whether his patient is suffering from this malady. We all know how, when we see a particular case of any disease, we are impressed by the differences of the appearances and symptoms which we observe from those described in various books on the subject; so, Dr. Wanklyn, in referring to the traditional criteria of smallpox, says: "If you ask me of what value they have been to me in the diagnosis of the cases which I have seen I can only say, very little, if any."

It needs, however, to be remembered, in reading Dr. Wanklyn's book, that his services have in the main been utilized—at any rate in recent years—in visiting the less obvious forms of the disease than those usually described, and that he is endeavouring to assist his reader by enabling him to recognize the disease whatever its appearances. This, in

chief value, for it is based upon observations of cases of smallpox so varied in this respect that only a wide experience would bring all under observation. Dr. Wanklyn agrees with Dr. Ricketts in saying that smallpox is a disease which seems to present more difficulties in its defection than do most others; but that it is, perhaps, of all diseases, that in which a certain diagnosis can be arrived at in almost every case. It is because of the importance of the subject that we give this notice of Dr. Wanklyn's book. It appears to us that he has rendered useful service in thus making his experience available for the many.

THE LATE DR. HERBERT MANLEY.

OUR June number contained an obituary notice of the late Dr. Herbert Manley, whose death has removed from among us an especially able and zealous worker in public health. It is with much regret we learn that his widow has been left in circumstances which make it desirable that a fund should be raised for her assistance. We commend this proposal to all Fellows and Members of the Society able and willing to contribute.

The following Fellows have already signified their desire to subscribe:—

The President, Dr. E. W. Hope	£5	0	0
Dr. George Reid	5	0	0
Dr. Bostock Hill	5	0	0

The following subscriptions have also been received:—

Dr. F. J. Allan	...	£1	1	0
Sir Shirley Murphy	...	1	1	0
Dr. A. Newsholme, C.B.	...	5	0	0
Dr. L. C. Parkes	...	2	2	0
Dr. F. E. Rock	...	1	1	0

The Hon. Treasurer of the Society will be happy to receive any further contributions, which should be addressed to 1, Upper Montague Street, Russell Square, London, W.C.

APPOINTMENTS.

DR. JOSEPH CATES has been appointed medical officer of health to the county borough of St. Helens.

DR. W. M. CLENDINNEN has been appointed medical officer of health and school medical officer for the Cannock U.D.

DR. ALBERT HAROLD GODSON BROWN, assistant medical officer of health for Burnley, has been appointed tuberculosis officer and medical officer of health for Deptford.

DR. S. G. MOORE, the medical officer of health and medical adviser to the local Insurance Committee, has been appointed chief school medical officer to the Huddersfield Education Committee.

DR. J. M. TAYLOR, of Stonehaven, has been appointed assistant school medical officer to the South Shields Education Committee.

DR. JAMES WOOD has been appointed medical officer of health and school medical officer for the urban district of Chadderton.

THE RELATION OF MEDICAL BENEFIT UNDER THE NATIONAL INSURANCE ACT TO THE PUBLIC HEALTH.

By MEREDITH YOUNG, M.D., D.P.H., Barrister-at-Law, County Medical Officer of Health, Cheshire.

IN introducing this discussion I must, in order to develop my thesis or argument, start with two statements of fact, or what I conceive to be fact. The first of these statements is that the medical officer of health is in his present capacity running in far too narrow a groove, and in reality has emerged but little from the rut in which he was placed when his office was first created in 1872 (the natal year of the first real public health service), and when he was endowed with duties which were those of a sanitary inspector pure and simple. True, his scope of work has been enlarged by a generous interpretation of that wonderful Public Health Act of 1875, and particularly by regulations of the Local Government Board; but he still is, as Mr. Sidney Webb puts it, dealing far too largely with the "non-human environment." In this work he is very considerably wasting the special qualifications and training he possesses. This criticism applies to metropolitan medical officers of health in particular, and, having had a short experience of that work, I can testify to the large amount of truth contained in the description of these officers as "merely glorified sanitary inspectors."

The time has come when, as is the case in all the very large towns at present, most, if not all, of the duties appertaining to the "non-human environment" could safely be transferred to a Sanitary Department as distinguished from a Health Department, and the medical officer of health left free to utilise his special qualifications in the sphere of the really human environment, being called in for consultation in cases where special questions of health were involved in connection with sanitary work. The second statement I wish to make is that at the present time there is a deplorable overlapping of public services for the treatment and control of disease. How the public health service has invaded the kingdom of the treatment of disease is as well known to you as it is to me. I leave out the important and valuable voluntary public services which are spreading over the country, for in a properly organised health service there should be virtually no room for such voluntary services which are created by a conjugation of heart and purse

without the intervention of head—I speak generally, of course. Municipal fever and small-pox hospitals, the supply of antitoxin, bacteriological examination of secretions and discharges, health visiting, the provision of milk depôts, contributions towards medical aid in child-birth, the hospital treatment of puerperal fever, the subsidising of school clinics for inspection and treatment, the cleansing of verminous persons, the provision of nurses for home visitation—all of these are forms of *treatment*, call them by what pseudonyms of *prevention* you will. That is always our excuse—and a pretty thin one it is in some instances—that our proposals are really preventive in object; that the infectious or contagious case properly isolated or treated is a potential focus of disease removed. Truth—but only half the truth. Year by year we go on annexing, as the Scotch say, first one disease and then another, and calling them (quite rightly) preventable, as though every disease is not in reality preventable in any broad interpretation of that term. The Reports of the Registrar-General demonstrate that over 50 per cent. of all deaths are due to fairly well-known infectious diseases, and the remainder may in a few years be shown to be, at all events, due to controllable causes. We are enlarging our category of preventable diseases at a rapid rate, and, I think, quite properly so. The next victim to our claws (if you will excuse my putting it in this way) will probably be cancer, and after that will follow pneumonia, the group of venereal diseases, acute rheumatism, arterio-sclerosis, endemic goitre, and a number of blood diseases, to mention only a few potentialities. We do not need to wait for the elucidation of the actual cause of disease before we start to eliminate it; typhus fever is an instance of this, for we do not know its *causa causans* even at the present day. Similarly we are making steadily successful warfare on scarlet fever, measles, and whooping cough, though we are as far off knowing their precise *causae causantes* as we were 100 years ago. Other authorities are also dealing with preventable disease—Poor Law Authorities in particular, as you all know. The Home Office is dealing with occupational diseases, and is reaching out its tentacles on the least possible provocation, and scheduling, just like Public Health Authorities, first one disease and then another as preventable, and therefore to be prevented by proper appliances and proper conditions of employment. The National

Insurance Act, the limits of which appear boundless, has already coupled us up with the public medical service in the case of tuberculosis, and when the Bill dealing with mentally defective children is placed on the Statute Book we shall most probably be linked up with still another branch of public medicine.

I have, perhaps, said enough to justify the two statements with which I started. To quote them again briefly: they are that, as medical officers of health, we are still caged up in the badly bent bars of the antiquated Public Health Acts, and we are the partial cause of a vast amount of overlapping of preventive treatment and a vast amount of waste of public money. The last-named matter does not annoy me so much as the first, because waste of public money is, or appears to be, inevitable when the general public, who ought to be its conservators, are allowed to have any say in its distribution. But one cannot help being perturbed when, after carrying a case up to a certain point, one has to abandon it to another public body, whose ideas may be wholly different to those one has formed, and as likely as not quite wrong. I am one of those who, to use a golfing phrase, likes to “hole out every hole.”

These are more or less universally conceded premises to what I want to put before you to-day. And they lead up to the two general propositions which form the gist of my introduction to this discussion, viz. :—

(1) That the time has come, and is now opportune, having regard to the immense potentialities of the National Insurance Act, for a unification of the public medical services already in existence, including that concerned with the administration of medical benefit.

(2) That the medical officer of health should, whether the above proposition commends itself for adoption or not, interpret his duties as defined by the regulations of the Local Government Board as dealing with the prevention and administrative control of disease, rather than the amendment of the sanitary environment of the public, leaving the latter largely in the hands of a sanitary service as distinguished from a public medical service.

There are two ways of carrying out the first proposition, *i.e.*, the unification of the public medical services. The first is what the Local Government Board are, in a more or less futile way, striving after now—the combination of offices. That is to say, an endeavour is being made to have the same man appointed

to act as medical officer of health, as district medical officer under the Poor Law, as certifying factory surgeon, as public vaccinator, and the like. The appointments which have been made under this *régime*, few as they have been, have probably done some little towards the desired end. But, to my way of thinking, the root idea is totally wrong: the proper method is the *unification of authorities*, and not merely the unification of offices. No matter how one combines offices in the same person, the officer appointed is still responsible to and cramped by the legal limitations of the various authorities to whom he has to trust for active measures. And it is the possibility of overlapping of the powers of these authorities that one wants to guard against. Given the combination of authorities the combination of offices would be sure to follow, but the reverse will never secure the desirable end—the abolition of overlapping and of undue public expenditure.

Disease is not just an individual misfortune; taken in mass it is a national disaster, and should be dealt with nationally, and not merely individually. The Insurance Act provides, in a way, for this in the excessive sickness sections; but that hardly goes far enough, in my opinion—the disaster has to happen before the remedy can be applied under these sections. What is wanted is a watchful and ever-vigilant eye, having everything within easy range of its accommodation. And unless we, as medical officers of health, are intimately associated with the working of the medical benefit sections, we shall not be called in to express any opinion until this disaster has actually happened. We must be overseers of the general public health whether the disease is preventable or not. This means that we must have a certain amount of control (I will not venture to define its extent) over infirmaries, municipal hospitals, Poor Law infirmaries, municipal sanatoria, and other institutions for the treatment of tuberculosis, voluntary health agencies, maternity and nursing agencies, and the control of vaccination and death and birth registration. These should be managed and controlled at the head by one supreme Health Authority. The taking over of voluntarily supported or endowed institutions, such as hospitals and infirmaries, would be a necessary part of any scheme for a State Medical Service, but should present no insuperable difficulties. A somewhat similar position arose under the National Insurance Act in the case of existing Sick Clubs and the accumulated funds of Friendly Societies, and

has, I think, been fairly and adequately met. The question of endowments and trusts could be met much in the same way as the Education Act of 1902 met them in the case of elementary schools, and we might have, for instance, with hospitals, as with elementary schools, the provided and the non-provided class, both managed by the same public body. This would certainly simplify matters in the early stages, and prevent the revolution being too drastic for the average conservative Britisher. This all comes very near to a State Medical Service, though it is not by any means the same thing, and I think could be carried out without the actual creation of a State Medical Service. All that is needed is a unification of existing authorities with the medical officer of health as the advisory head, or commander-in-chief. I name the medical officer of health because, if you leave him out, I cannot see where you are to go for an administrator. When this opinion is propounded there will at once arise a chorus of protest, and I should not wonder if the leader of the orchestra were to be the British Medical Association, which for some years has not been the whole-hearted supporter of the medical officer of health that one would have expected it to be, and had every right to expect it to be. It will be said by this chorus that the medical officer of health is not sufficient of an expert to be able to administer a programme such as this—that he knows nothing of hospital management, that he has forgotten all he ever knew about surgery and midwifery, that the sum total of his clinical knowledge is next to *nil*, and so on.

But, of course, we all know that in order to administer an organisation of this kind it is not necessary for a head to be able to carry out every detail himself; the power of administration consists in essence of being able to see things in perspective, and to delegate duties and organise different units in an orderly manner, dealing out specialist work to specialists and dovetailing the whole into a smoothly working machine. The head of a cotton-spinning concern would probably be a very indifferent spinner or boiler-tenter, and the commander-in-chief of an army would assuredly make a fool of himself if he meddled with the mechanism of a Maxim gun. Administration is the special *métier* of the medical officer of health, and, given a fair chance, no one has any well-founded doubt about his rising to the occasion.

There are all sorts of wild ideas prevailing in connection with this question of a State Medical Service. One of the commonest is that private practice would be swept out of existence and all persons, whatever their position or means, would have to employ State doctors. Prof. J. A. Lindsay, in the *Lancet*, of April 12th, falls into this error and writes:—"Her Ladyship might, without undue snob-bishness, hesitate to discuss her ailments with the doctor who was in attendance on her cook or her footman." No one who has really given the question any thought imagines for one moment that any such possibility is likely to arise. Only people below a certain income limit would come under the benefits of a State Medical Service, and there would always be a large residuum left for the purely private practitioner who did not care to accept office under the State. The social difficulty would have to be recognised on the one side, and on the other side we should have always a large body of men who would not lightly surrender lucrative and possibly specialist practices built up at considerable expenditure of labour and capital. Any State Medical Service must be an army, and must be organised on army lines with a gradation of officers and with special corps to deal with special matters as well as special institutions for various diseases and for research work. As Dr. Benjamin Moore puts it, we must have "central control and a national co-ordination." Promotion must be made to depend entirely on merit and ability, otherwise we shall degenerate into what has been called, with some truth I fear, "the bottle of medicine" of the Poor Law. There may be a need for the application of some system of Imperial grants-in-aid of such a service, such grants to be dependent on local efficiency and intended to encourage effective and energetic administration. And there would probably have to be a reorganisation of the Local Government Board and the creation of a Ministry of Public Health—both of them highly desirable, if not actually necessary, at the present moment. Amongst the advantages of a State Medical Service (and it may even follow the operation of the medical benefits of the National Insurance Act) I think we may fairly reckon a heightening of the standard of general medical practice. The rational parcelling out of work, which would be an essential feature of a State Medical Service, would leave more time for individual study and the attractions of promotion would act as a stimulant in the direction of

self-improvement. The one query which will at once occur to all of you is whether under a unified medical service the general public are going to be better off and the public health improved. I think the answer to this must of necessity be in the affirmative. Leaving out what I have just alluded to—the personal improvement of the general practitioner—I think the public will eventually be the gainers. They will have the advantage of consultants' opinions, of special research work adequately organised, of easy transference from one institution to another, and, what is of the highest importance, of having their bad social habits pointed out and compulsorily cured by people who are at once healers and health-missioners. There will, moreover, be no need for false modesty or hesitation in speaking frankly and openly about venereal diseases, alcoholism, drug habits, mental deficiency, early malignant disease, early tuberculosis and the like. That these are evaded or slurred over at the present day is acknowledged, and such evasions or negations are all too common a cause of disaster to the public health.

Naturally a State Medical Service must not be made too attractive to the public, or we shall have one and all abusing it as they now abuse voluntarily supported hospitals, and the result will be that the pocket of the nation or the practitioner will continue to be picked. The almoner system must be rigorously applied in order to avoid any risk of this abuse.

I spoke a short time ago of the waste of money owing to overlapping of public, medical and hygienic services. There is another waste of medical energy and money going on, and probably a more serious one. As you all know, there are many large hospitals at which research work of one kind and another is being carried on, and the staffs at these hospitals are working more or less as self-contained centres, elaborating methods and carrying out experiments which are largely unobserved (to say the least) by others similarly engaged. Surely a co-ordination of specialised work of this kind would lead to less waste of energy and money and conduce to more rapid and more certain progress. One must commend most highly all such work, but, at the same time, one cannot but regret the waste of energy caused by inco-ordination.

Since the coming into operation of medical benefit I am told there has been a slight, but fairly general increase in the attendances at the out-patient departments of infirmaries, the

reason being probably that doctors are being more consulted, and consulted, moreover, at earlier stages of disease. There is the hope—if this be true—that such diseases as cancer, tuberculosis, heart disease, etc., will come earlier under treatment and have an increased chance of cure.

If any use is to be made in the future of statistics to be gleaned from the data which the Act should make available, I think the present is the time our claim should go in to the Government for access to these data. There should be available for the first time in the history of public health the chance of working out tables of expectation of sickness for various ages, classes and localities and of checking statements which are made from time to time, often on somewhat slender foundation—as to the healthiness or otherwise of certain occupations and places. But it is hoped that what may be termed pseudo-strikes amongst the medical profession, such as, for instance, have recently been taking place in Hyde and parts of Lancashire, where the doctors have declined to state on the patient's certificate the nature of his illness, will not continue, for such a practice will destroy this excellent statistical opportunity.

In making any estimate of sickness prevalence under the present Act considerable allowance will, I am confident, have to be made for malingering which is reported to be fairly generally in evidence. As regards malingering I am perhaps too hopeful, for I cannot bring myself to think that many men are going to pretend to be ill on 10s. a week or many women on 7s. 6d. per week, though one has heard of occasional cases. There has been experienced in Germany what will undoubtedly be experienced here, namely, a considerable increase in the claims for medical benefit during times of reduced employment. At such times there is a strong and very human tendency to exaggerate mere *malaise* into actual organic disease and to convert the sickness benefit into a form of unemployment insurance. There are, as we all know, plenty of "Weary Willies" and "Anæmic Annies" in the world, and the danger will have to be carefully guarded against alike for the purpose of preventing improper encroachments on the available funds and of avoiding vitiation of statistical returns. A distinction will have to be carefully drawn, too, between various grades of illness—totally incapacitating, partially incapacitating, and even non-incapacitating (as, for instance,

the tuberculous case with arrested lesions who is able to do a full day's work though still, for example, receiving tuberculin injections). In the case of sanatorium benefit a generous interpretation of the Act has enabled the tuberculous person to be provided with adequate food and adequate clothing in suitable cases, and in the case of the person receiving medical benefit a similar extension of the benefit in the matter of special diet would undoubtedly be of advantage, for example, in cases of diabetes mellitus, albuminuria, gout and the like. It is somewhat questionable, however, whether the available funds will stand this.

One hopes that before entering on a Life Insurance Branch of the present venture, as appears to be proposed, the Government will endeavour to find a means of extending the sickness, sanatorium and medical benefits of the Act to those whose needs seem to me to be just as urgent as those of employed contributors, *i.e.*, that large section of the population consisting of gentlefolk who are in straitened circumstances, and whose income and expenditure accounts show a very slender margin to provide for attendance and medical necessities during time of illness.

One has to look somewhat afar in estimating the benefits of sickness insurance, and I therefore crave your indulgence for alluding to an aspect of the matter which appeals somewhat strongly to me, as it probably will to many of you. This aspect of the case is one concerned with the cost of living. It is an admitted fact that since the introduction of the Insurance Act the cost of living has gone up. Manufacturers tell one, quite frankly, that their contributions under the Act are booked to the wages account or general expenses account, and, being thus naturally counted as part of the cost of production, eventually and inevitably appear in the price of the goods. The wholesaler and retailer look at the matter in the same light, and the result is that the purchaser in the end pays the contributions of the manufacturer, the wholesaler and the retailer. The net result is that, though a certain class benefits, it benefits largely at the expense of the class just above it, and of a class which is already taxed in many instances far beyond what it can fairly stand, with the result that the health and well-being of this superior class is going to be further strained, and possibly strained beyond the limits of reasonable endurance.

As bearing upon this aspect of the question, I was much struck by the perusal of a White Paper issued whilst the Insurance Bill was in the throes of parturition dealing with opinions of employers in Germany on the benefits of sickness and invalidity insurance. One and all of these people spoke with the greatest commendation of the increased working capacity of their employees which had resulted from this form of insurance. And well might they be pleased, for the increased productive power of their workers was being purchased, largely at all events, not by them, and not by the class who were manual workers or artisans, but by the classes just above that level. Glad as one is to know of any increased productive power when it is an index of increased public health, one wants the burden to rest on the proper shoulders, and one does not see much *national* benefit resulting from the mere shifting of sickness incidence from one section of the population to another.

The claim that a few years' operation of the medical benefits of the Act, coupled with the provision for old-age pensions, will result in the virtual closure of the Poor Law infirmaries—a claim which is being made by a few of its very ardent supporters—is one which I venture to think will be viewed with a considerable amount of scepticism by most of us. I do not think that the Poor Law infirmary is or ever has been largely fed by the class now known as insured persons, though I must grant that the unemployment insurance provisions of the Act will prevent destitution to a large extent, particularly by protecting the worker dependent on season and weather. Actual experience alone will show whether these rosy prognostications are to be realised.

The work of the Poor Law is not that of building up a healthy population, but, cut down to its really narrow basis, is of preventing the destitute from dying as long as possible, and possibly also of building up the broken-down destitutes so that they may once more, for a short and intermittent period, become capable of more or less self-maintaining work.

One cannot help noticing in the White Paper (Cd. 5679), issued during the debates on the Insurance Act, the very guarded nature of the opinions extracted from Poor Law institutions in Germany on this question. Almost every one of these German opinions on the relief afforded to the Poor Law is accompanied by the statement that "this relief cannot be set forth figuratively"—"cannot be stated

in figures"—"it is impossible to show this statistically"—"it is impossible to prove it by figures"—"cannot be stated statistically"—"difficult to advance statistical proof"—and so on. The reasons for this impossibility are, to my mind at least, too vague to be satisfactory, and I prefer, therefore, to maintain the position of Thomas a Didymus on this aspect of matters. I say this, in spite of the statements which one sees in the public Press in the reports of meetings of Boards of Guardians, that the number of applicants for medical relief is less since the coming of the National Insurance Act. No one will be more pleased than myself to see such statements verified by statistics. The private practitioner will be one of the first to benefit by such a change if it should occur. A considerable number of non-paying patients will, if this happens, be placed in a position of independence, and will naturally go to their private practitioner for advice and assistance.

It has always seemed to me that an extension of periodical medical inspection to adults would be an excellent thing. Many sensible people nowadays visit their dentists once a quarter or once every six months, so that they may know whether their teeth are in a satisfactory state; but they do not seem to realise that hearts and lungs, and livers and kidneys are of any special importance, and unless disease prompts them to seek medical advice, or they present themselves as life insurance candidates, or are up for an appointment where medical examination is a *sine qua non*, these important organs are left to look after themselves, and incipient disease fails to be detected. How much more rational it would be to have periodical and systematic medical examinations carried out and a kind of health census taken annually. The present Act, with a very slight modification, could ensure this benefit at no great expense for all insured persons, and I hope that it may be possible to introduce this feature into any amending Act.

My final comment on this Act may perhaps be deemed irrelevant by some, but that it is warranted I have not the slightest doubt; it is that, if the State had granted a similar contribution to that which it is giving to insurance committees to sanitary authorities, for the purpose of improving the housing conditions and general hygienic environment of the people, the public health of the nation would have been raised more certainly, more lastingly, and to a much higher level than it is ever going to

be raised by the present programme. The money spent on sanatorium benefit, leaving out the special sixpenny grant for domiciliary treatment, would most certainly have been better spent on housing, for, with it in our hands, we could have made every workman's house the next thing to a sanatorium, at all events.

I am all too conscious of not having dealt with this subject in as thorough a manner as might have been done. Recent illness has disorganised my work, and the effort of bringing it up-to-date has been a strenuous one. Moreover, I have approached the subject with some diffidence. I think it would have been better dealt with by someone having not only experience of public health work, but, coupled with that, a larger experience of general practice than has fallen to my lot. I felt as I wrote my remarks somewhat in the position of the old man Krook—a character well-known to all readers of "Bleak House"—when he was chaffed about his slow but sure method of learning to read:—

"I don't know what I may have lost by not being learned afore. I wouldn't like to lose anything by being learned wrong now."

I have tried to look on this matter in a purely general manner, and I may have failed to get the proper perspective. Nothing is to be gained *at first*, in my opinion, from a descent into details—they can be adjusted later. We have here a large body of men well qualified to speak on both the general aspect and its details, and I hope the fullest discussion will take place on what is, in my view, one of the most important public health opportunities that has yet come our way.

RESEARCHES ON ANTI-CHOLERA VACCINATION.*—Sebastiani records the results of a series of observations on guinea-pigs treated with anti-cholera vaccines of various types. Reference need here be made only to two of his conclusions, viz., that to produce immunity to five minimal lethal doses of the cholera vibrio at least two injections of vaccine were necessary; and that the blood serum became strongly bacteriolytic subsequent to vaccination with Kolle's or Wright's vaccine.

VACCINE TREATMENT AND THE OPSONIC INDEX IN LOBAR PNEUMONIA.*—Palmerini treated nine cases of pneumonia with vaccines, in some cases autogenous, in others a stock vaccine. He concludes on the strength of this series that the use of vaccines does not perceptibly advance or retard the crisis; but that the opsonic index rises at an earlier stage and more markedly than when no vaccine is given, and that at the same time the disease becomes clinically of a milder type.

*Annali d'Igiene Sperimentale, vol. xxii. (Nuova Serie) Fasc. iv., 1912.

THE OUTDOOR TREATMENT OF SCARLET FEVER.

By HERBERT M. CARGIN, M.B., D.P.H., Assistant M.O.H., Birmingham, late Medical Superintendent, City Hospital, Birmingham; and T. GRAHAM SHAND, L.R.C.P., (Ed.), D.P.H., Assistant M.O.H., Wakefield, late Medical Superintendent, City Hospital, Witton, Birmingham.

THE outdoor or "open air" method in the treatment of scarlet fever, though occasionally referred to during the past few years, has not received the attention and trial it has deserved, and apart from the eucalyptus oil method of Dr. Milne, the tendency seems to be rather to continue on the old lines.

For the past two years the outdoor treatment has been in constant use at the above institutions for all the severe and septic types of scarlet fever, for some of the milder cases, and also for a considerable number of the complications resulting from this disease.

It seems to us that, in view of the apparent benefit accruing from this method, some good might obtain from the publication of the results.

The cases chosen were especially the anginose, septic, and severe types of the disease. It will, of course, be appreciated that as the majority of the malignant types are admitted practically moribund, it was only possible to subject a very few of them to this treatment.

A number of mild cases were also treated in this manner, more for the purposes of control, besides many patients suffering from the various complications, such as albuminuria, rhinorrhœa, otorrhœa, adenitis, and joint pains.

Method.—The wards in this hospital, like those in most other hospitals, have not been adapted for the outdoor treatment of infectious diseases, and although there are covered verandahs at each end of a few of the wards these are considerably exposed, and are not protected sufficiently to allow of the patients remaining there during stormy wet weather.

Consequently the cases under consideration were, with a few exceptions (five per cent.), taken out in the morning between the hours of 8 and 10 o'clock and were again brought inside in the evening at dusk. In dry weather the verandahs were for the most part discarded, and the beds placed quite in the open, in the paths and grass plots separating the various wards, the most sheltered side of the block being chosen in boisterous weather.

Particular attention was paid to see that these patients were protected by clothing from the cold, and instructions given that each one should be visited frequently by one of the staff

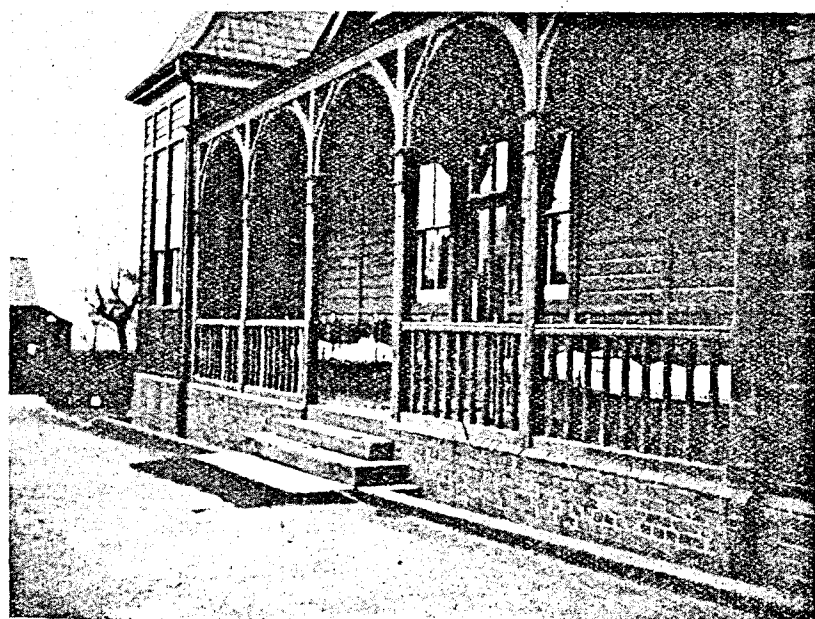
on duty, and enquiries made as to the warmth being maintained. Woollen or flannel gowns were provided for all patients treated in the open, sheets usually dispensed with, and hot bottles supplied if these were thought necessary by the nurse. No covering in the way of a roof was supplied to any bed, except during the very warm sunny days, when some protection from the sun's rays was afforded, usually by a towel or sheet arranged on the upper rail at the head end of the bed. The patients were fed and attended to by the nurses whilst outside, screens being arranged round the beds if required. All of them were forbidden at any time in cold weather to put their arms from under the bed clothes, or to sit up, or get up, from their bed.

out equally well in any institution with doors sufficiently large to admit a bed, and with the ordinary staff of nurses.

Our argument must be, therefore, if so much good resulted from these methods, how much better results might one reasonably expect were the institutions provided with open-air wards on the lines of our modern sanatoria, or even verandahs with "all-weather" curtains to enable the patients to remain practically in the open day and night.

It may be stated, in comparing the indoor and outdoor methods, that all patients were subjected to the following treatment:—

On admission, each patient has a warm bath; if very seriously ill, a hot sponge is substituted.



THE VERANDAH.

In the colder months not much difficulty was experienced in having these orders carried out, but in summer, during the heat of the day, children especially, but also adults, were somewhat lax in observing these rules, although we can confidently state no evil was apparent, even though the smaller children crawled all over the bed, with no other covering than a long warm gown. Those patients who were delirious, or so ill as not to appreciate their surroundings, or who, from perverse notions, were inclined to sit up in bed, were usually wrapped, and often pinned, in a blanket or sheet (depending upon the temperature of the day) before being placed outside.

It will be seen that the above methods are crude, and are such that they could be carried

This is usually followed by warm bath (blanket or otherwise) morning and evening during the time he remains in bed, and subsequently by a warm bath each night. In *hyperpyrexia* the usual hydro-therapeutic methods are employed.

Special attention is given to the performance of the mouth toilet. This consists in scrupulously cleansing the mouth, and especially round the teeth, with swab of carbolic (1-40), particular care being taken to remove all sordes and remains of food found so commonly at the junction of the gums with the teeth. All teeth cavities are emptied and thoroughly cleaned with similar swabs. This cleansing process is carried out daily during the first week after admission.

If the throat is clean nothing in the way of treatment is done; if dirty, a swab for inoculation

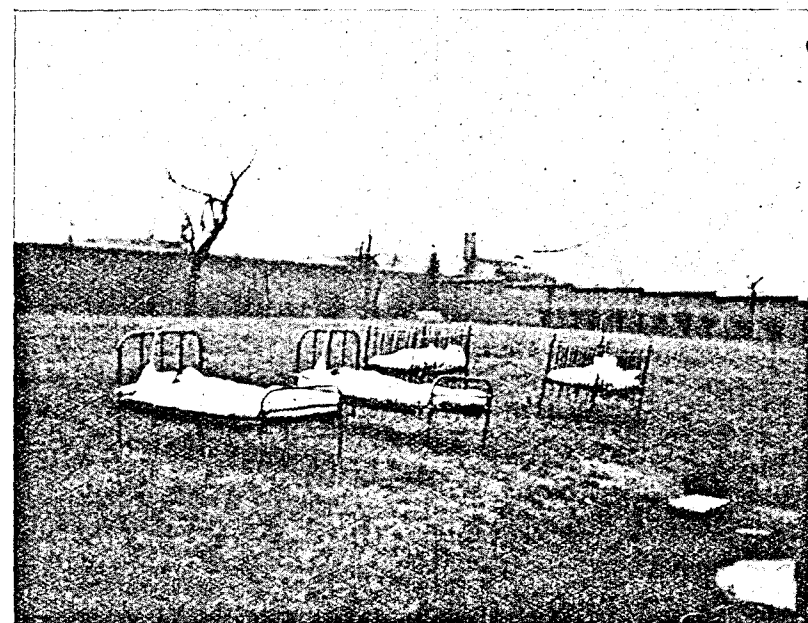
on blood-serum or nasgar is first taken, and then local treatment applied. If only follicular spots are found the glycerine and carbolic spray (1-80) is used four-hourly.

If the exudate is more than this, pure izal is also applied at least once daily. If membrane formation is suggested the throat is brushed with Löffler's solution thrice daily, and if the swab is "positive" diphtheritic antitoxin is administered. To this may be added the usual practice of douching the mouth and throat with weak boracic, or with a mixture of boracic and saline solution, before the application of the above-mentioned medicaments.

Diet.—Milk given in small quantities two-or-three-hourly, with cold water *ad lib.*, forms the

evidences of a bad type or severe attack of the disease, manifested by one or more of the following: high temperature, delirium, dark blotchy rashes, and profuse discharges, with or without marked enlargement of the glands, and only those who were moribund on admission were allowed to remain indoors. The results of this apparently heroic treatment were sufficiently remarkable to impress not only ourselves and the various members of the staff, but also the patients and their friends, and indeed so much was this so that we were frequently asked by the parents to allow their children to be treated in this manner.

In the worst cases a marked improvement became manifest usually within the first 24-48



OPEN-AIR TREATMENT.

main diet till the temperature comes to normal, when bread and milk and milk puddings are added; this is maintained until the second or third week, when fish and potatoes are given.

Provided no complications exist, patients are allowed to get up about the third week, and should the urine remain clear on daily testing until the 23rd or 24th day a full diet of meat, vegetables and potatoes is allowed. No medicines were prescribed unless indicated by complications.

We may again mention that these methods were followed practically in all cases, and the open-air treatment added in the 206 cases mentioned below.

The determining factor in the choice of patients to be treated in the open was essentially

hours after admission, this improvement being evidenced in the delirious patients, by a return to a more rational state of mind, and in every case by almost a complete absence of that restless turning and tossing in bed so common in severe attacks of this disease, and instead a great tendency to long intervals of calm and quiet sleep.

One is justified in concluding that at least partly as a result of this sleep the temperature usually within two or three days of outdoor life showed the beginning of those remissions seen in the early stages of a slow or rapid lysis followed at a short interval by a state of complete apyrexia.

When questioned patients of all ages were almost unanimous in stating their preference

for being out-of-doors even in the coldest weather, and a very common occurrence was that infants and young children sleeping peacefully and quietly outside became fretful and irritable on being taken into the wards and only the advent of another day and a return to the open air restored their tranquility of mind.

Other signs of improvement followed in rapid succession, perhaps the next most striking being the rapidity with which these children changed from fierce fighters when throat treatment was being attempted to a docility in marked contrast to their previous state.

At the same time the expression became brighter, the discharges showed considerable diminution, and often complete cessation, while the throat conditions rapidly improved.

The appetite, at first usually absent, except for a great desire for cold water, rapidly returned, and in the worst cases "pieces" were usually asked for before a week had passed.

One other point requires mentioning, and that is the rapid transformation occasionally seen in those patients, with dark blotchy rashes around the extensor joints, in which the body rash is usually badly developed.

In some of these cases within the first 26 hours of treatment (the hot-bath may be largely responsible for this) the mulberry tint largely disappeared to be replaced by a brilliant punctate red rash, and with this change the patient seemed to have considerably improved.

The total number of scarlet fever patients admitted during the period under review, namely, the year 1911-1912, was 1,163; amongst these 27 deaths occurred giving a percentage mortality of 2.320.

Subtracting from the total the 206 patients treated out-of-doors, there remained 957 treated in the wards, with eight deaths giving a mortality of 0.83%.

It will be remembered that these eight deaths occurred in those patients from amongst whom the severe and septic types of the disease had as far as possible been removed.

The analyses of these cases show that:—

- 2 died from Scarlet Fever and Diphtheria.
- 2 " " Generalised Tuberculosis (confirmed by P.M.)
- 1 " " Scarlet Fever and Pneumonia.
- 2 " " Scarlet Fever and Measles.
- 1 " " Malignant Scarlet Fever.

It will be granted that throat lesions often give rise to affections of the naso-pharynx evidenced by profuse nasal discharge, and also

infection of the Eustachian tube causing otorrhœa of long or short duration.

In our cases there could be no doubt that the throat condition cleaned up much more rapidly in those treated out-of-doors, and as a consequence of this, the number of septic discharges occurring amongst the patients was much reduced unless they already existed when the patient was admitted to hospital.

The following table gives the total number of patients treated by this method, with the sub-divisions of this group into those severely ill, and those with only mild attacks, with the corresponding mortality figures.

Our classification is as follows:—

Septic. Patients with one or more septic discharges.

Severe Septic. Patients with septic discharges and intoxication marked.

Severe. Cases with brilliant rashes and faucial lesions.

Very Severe. Rashes as a rule not well developed temperature of 103° to 104° and faucial lesions.

Anginose. Cases in which a collar of adenitis is present with exaggerated symptoms.

Malignant. Often no rash, patients usually moribund.

Types.	Number.	Deaths.	Percentage Mortality.
Septic ..	44	4	9%
Severe Septic	18	5	27.7%
Severe ..	37	0	0
Very Severe	30	3	10%
Anginose ..	6	3	50%
Malignant ..	3	3	100%
Mild ..	40	0	0
Hæmaturia ..	7	1	14.2%
Albuminuria ..	21	0	0
	206	19	

Total number so treated 206 with a death-rate of 9.2%.

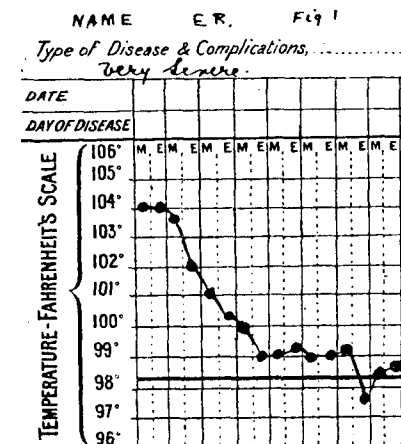
*The death under the heading of hæmaturia was due to heart failure following the complication of diphtheria with which the patient was admitted.

The following temperature charts and histories may be taken as examples of the rapid improvement so commonly seen in bad types of this disease:—

Case 1. (Fig. 1).

E. R., aet 21, admitted third day of disease; temperature 104°, with a very dark punctate rash, blotchy round joints; throat considerably swollen and covered with white exudate (swabs negative), marked enlargement of glands. Outside day and night from beginning. Two days later throat was clean, temperature 100.4°, rash only faintly visible, glands much less. Following day, temperature

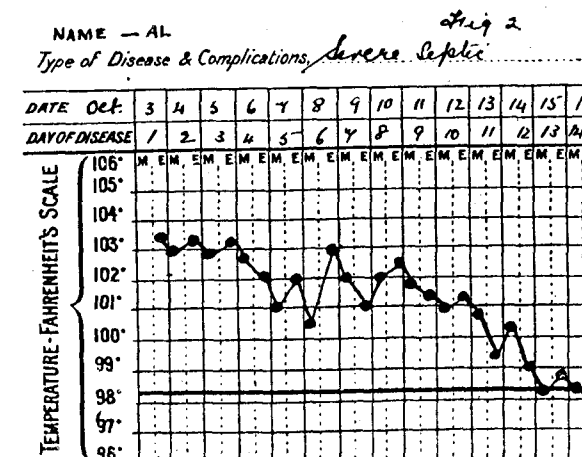
no complications. Discharged 29 days from admission.



99°, rash gone, and except for some enlargement of glands patient was quite comfortable. No after complications.

Case 2. (Fig. 2).

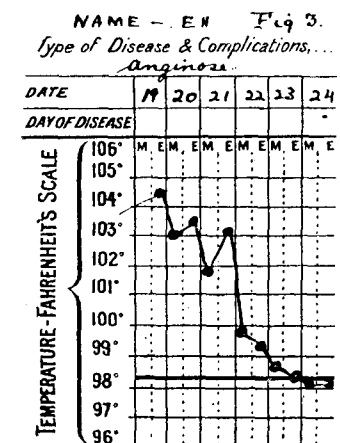
A. L., aet 6, admitted on first day of disease, extremely ill, temperature 103.5°; very dirty throat, enlarged glands, double



conjunctivitis and purulent nasal discharge; rash poorly developed; double otorrhœa the following day, and patient put outside. Temperature normal thirteenth day of disease. No other complications.

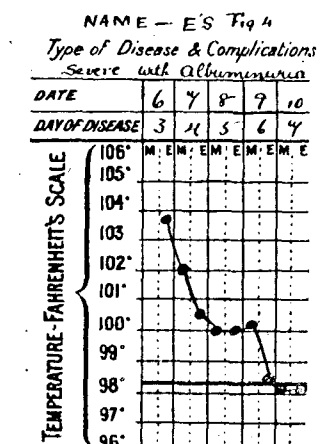
Case 3. (Fig. 3).

E. H., aet 5, admitted on third day of disease semi-unconscious, temperature 104.4°; very dark rash; considerable exudate on left tonsil, glands markedly enlarged; no sleep first night, very restless; second day, put outside; following day, throat clean, sleeping well, rash still very dark; fifth day, temperature normal, rash gone. Patient quite bright,



Case 4. (Fig. 4).

E. S., aet 4, admitted on third day of disease, temperature 103.7°; rash very vivid and blotchy; glands much enlarged, and considerable albuminuria. Put outside on admission; first night, very restless; rash still dark and blotchy.



Following day and night patient slept well. Fourth day, temperature normal, rash gone, albuminuria had cleared and patient was taking a "2" diet—milk, bread, and pudding. Convalescence was uninterrupted.

Table.—Giving percentage complications developed amongst those treated.

	Inside.	Outside.
Rhinorrhœa ..	26.9	6.7
Otorrhœa ..	16.3	5.8
Abscesses ..	5.2	3.7
Nephritis ..	2.8	0

Unfortunately the open-air treatment had apparently little or no effect upon the discharges occurring later in the disease, and cases seemed to improve equally well inside the ward as in the open.

But we repeat that complications were much more infrequent in these patients treated in the open during the early stages of the disease, and consequently we believe that by this method the stay in hospital is considerably shortened.

Believing that the majority of the cases of albuminuria in this disease are mainly of a toxic nature, twenty-one patients presenting this complication were likewise treated in the open. The results again justified the treatment, and it was no unusual occurrence for the condition to disappear within a period of about ten days from their removal from the ward. Further, not one of these patients so treated developed the more serious complication of hæmaturia or any other signs suggestive of nephritis. It is only right, however, to add that a few of those cases (three) continued for lengthy periods, and were apparently uninfluenced by this treatment.

It might be stated, in parenthesis, that in the long continued albuminurias startling improvements were frequently observed by the administration of Pulv. Ac. Boric. Gr. V. to X. thrice daily.

Conclusions.—That many apparently hopeless cases of scarlet fever recover by this method. All cases are benefited by it. In patients so treated, the complication of discharges are less frequently developed than in those treated inside. Many cases of albuminuria rapidly recover and that extension of this complication was never observed. As a consequence of these results the stay of patients in hospital is considerably reduced.

VITALITY OF THE CHOLERA VIBRIO IN MILK AND IN FLIES.*—Sampietro gives a summary of his observations, which show that in raw milk at room temperature the vibrio may live from 11 to 63 hours, while at 37° C., it does not survive beyond 6 to 8 hours. Its vitality is moreover much diminished by the presence of lactic acid. Flies can carry the organism both externally and internally, as can also the larvæ of infected flies. The pupæ, however, do not contain the vibrio. Flies developing from larvæ reared on infected material are not themselves infective.

SMALLPOX AND VACCINATION.—Treatment and prevention by vaccines is now upon a thoroughly scientific basis, and, like other exact sciences, it finds detractors among people who are too stupid to appreciate the evidence on which the science is based. Of course, it is not wrong to be an anti-vaccinator—it merely stamps a man as being ignorant and out of date.—*St. Austell Rural District, Report of the Medical Officer of Health, 1912.*

* *Annali d'Igiene Sperimentale*, vol. xxii. (Nuova Serie) Fasc. iv., 1912.

THE ORGANISATION OF SCIENTIFIC METHODS FOR THE CONTROL OF TUBERCULOSIS.

By HILDA CLARK, M.B., Late Tuberculosis Medical Officer, Portsmouth.

THE Reports of the Departmental Committee on Tuberculosis, with the comprehensive appendix giving the opinions of the best known authorities, show clearly that the problem must be dealt with in its different aspects by the statistician, the sociologist, the politician, as well as by various branches of natural and applied science.

The reason for this is evident when it is remembered that tuberculosis, an important cause of loss of life and of economic waste to the community, is a widespread disease of chronic nature, that its incidence is closely connected with social and economic conditions, that the diagnosis at a curable stage is uncertain, and that treatment by any measures so far known is very prolonged.

The problem could apparently be solved in a simple manner by complete isolation of all infective cases. The possibilities of concealment are, however, so great, the danger from the majority of careful patients so slight if the home conditions allow of the necessary precautions, and the hardships involved would be so overwhelming, that public opinion does not tolerate the idea.

In order to understand the lines on which success may still be attained without this, study must be made of the main features of the problem.

Complete natural immunity to tuberculosis—that is to say, complete protection, so that the tubercle bacillus cannot obtain a foothold—is not demonstrable in man.

It is believed that the only protection lies in the power of responding to the stimulus of infection by producing immunity to it, so that recovery is possible.

This power, which is inherited, varies in degree in different races and different individuals. It is not present at birth, but it develops as a child grows. There is no doubt that it is often so prompt and effective as to enable a person to recover without knowing that infection has been incurred.

It is probably influenced to a great extent in an individual by environment—that is, by incidental conditions of general health, nutrition and conditions of life—but such alteration only affects the individual, and is not

inherited. The good environment must therefore be provided also for the offspring in order to reproduce the alteration.

The action of the law of natural selection upon these inheritable variations may be profoundly affected by the environment and habits of a race. If massive infection combines with habits and environment unfavourable to resisting power, a whole people may be swept out of existence before adaptation has time to occur, since even those with best resisting power succumb.

If, however, habits of life expose to slight infection rather than to severe, and if environment, including possibilities for treatment, gives those who possess the power of response an opportunity to exercise it, these will survive and their power will be handed on, while only those destitute of it will succumb. Thus the population as a whole may become resistant.

It should be noted that the change is in the number who succumb, not in the number who are infected. The latter can only be reduced by obtaining control of the sources of infection. When this is done, and no infection occurs, natural selection of those able to respond ceases to act, and theoretically the resisting power of the nation as a whole may be lost, so that if a sudden severe infection were to regain foothold, it might devastate the population in the way it has been seen to do when civilisation first introduced it.

Experience of the conquest of other infections, however, shows that the sanitary measures through which control was obtained may be relied on to detect a re-introduction of infection at a stage when it can be dealt with effectively.

So far as is known, the production of immunity to tuberculosis can only be called into action by the stimulus of the tubercle bacillus. However healthy a person may be and however good the environment, it can only be developed *after infection by the bacillus*.

The exact extent to which this occurs is not yet known. As a rule, when the infection is sufficient to cause definite symptoms, the dose of bacilli has been too great for the degree of immunity possible; and although the latter may keep the disease in check, the bacilli are not destroyed, and are liable to be roused to action if the victim's resisting power is affected by any temporary cause.

Hence we have the general opinion that those who have once been phthisical are liable

to relapse. It is only recently that we have realised that the infection is much more widespread than would be suggested by the number of deaths from phthisis, great though this is, and it will perhaps be found that slight infections in early life from which the patient is able to make complete recovery play a very different part from those which result in chronic ill-health.

In babyhood great danger results from tubercular infection. It has already been mentioned that the power of acquiring immunity has not developed at this age, and an acute and rapidly fatal illness is liable to ensue.

This happens very frequently among the working classes, but is comparatively rare among those who are less exposed to infection in childhood.

The result is that in the former case most of those who inherit a deficiency in, or a late development of, the power to recover from tubercular infection are weeded out, while among the well-to-do classes such are more likely to survive childhood.

In dealing with working-class adult phthisical patients, the presumption is that they possess a considerable degree of resisting power to tubercle, since otherwise they would have succumbed in infancy. There is, however, much to be gained by saving the susceptible children, since they are not necessarily weak or unsatisfactory in any other respect, and if time be given them to develop their natural power of overcoming infection, even if this be somewhat poor, science has shown us how it may be strengthened and made effective by a healthy environment. If failure to overcome infection should show this to be inadequate, it may still in some cases be promoted by the artificial stimulation of tuberculin treatment.

The special liability to infection in childhood, and the effect of environment (in the wide sense of the word) on the child's power of resisting the infection are largely within the control of society, and are of supreme importance in considering the bearing of social and economic science on the control of the disease.

The possibility of treatment of any kind—stimulating the resisting powers in infancy depends on the age at which infection has occurred and the time of development of the resisting powers.

Very close observation is necessary to see at what point active stimulation may be successful.

As soon as the power of resisting the infection is established, a different type of disease is found in those cases where it is not entirely conquered and the bacilli continue to live in a quiescent state. The number of these is known by post-mortem records to be very great, but the diagnosis is very difficult, and it is rarely possible to demonstrate tubercle bacilli during life.

Acute and fatal cases of tuberculosis of the lungs are not often met with between the ages of 3 and 15 years. The exact relation of the chronic condition to the fatality of other diseases on the one hand, and to the incidence of phthisis in adult life on the other, is not fully understood, although it is extremely important.

It is during this period that the chief incidence occurs of a very different type of the disease in cases classified together as "surgical tubercle." Although many of these patients suffer from the disease in more than one focus, in the bones, joints and other organs, it is quite unusual to find the lungs and throat affected, and there is much evidence to show that they are actually less likely than other children to develop pulmonary tuberculosis. Since any danger from infection can be easily overcome, the question of treatment can be considered purely in relation to the individual. Early diagnosis is of the same importance as in all other diseases, but it is much easier than in the case of chronic pulmonary and glandular tubercle, and has not the same special significance that it possesses in these cases.

It is at the time of adolescence and later that the illness known as consumption occurs. This may be acute or subacute, and it is generally recognised now as a phase of a chronic condition. The first symptoms to appear are those of reaction to the infection, caused during the attempt to produce immunity. This is soon accompanied by a greater or less degree of poisoning by the action of the bacillus. If this proceeds far enough, the destruction of tissue by the bacilli can go on rapidly, and the two together may cause the death of the patient, generally aided by the action of other bacilli.

The varying course of the illness, generally marked by alternating improvements and relapses, and the wide differences in different patients in both course and result, depend on

the effect of a constantly changing environment on his innate resisting power. Treatment, therefore, can never ignore the environmental conditions, though the practical possibility of a complete understanding and regulation of them is severely limited.

This difficulty might be lessened if a method could be found of directly and rapidly attacking and destroying the bacilli, that would be both generally successful and widely applicable. This, however, has not been attained as yet, and all methods in general use for the majority of cases are closely concerned with the stimulation of the patient's resisting power and its concentration on the focus of disease.

Occasionally this is rapidly successful, but as a rule a long time is needed to secure the maximum improvement in the resisting power of any given case, and often this maximum can only be maintained by continued or frequently repeated efforts. Where this is the case, it is obvious that the power for good and evil of environmental conditions becomes much greater.

This is one reason for the extreme importance of sociology in the control of tuberculosis. The other lies in the importance and difficulty of early diagnosis.

It has already been pointed out that the illness known as consumption is generally the acute phase of a chronic condition.

It cannot yet be proved that this is always so, but there is no doubt that every case goes through a longer or shorter period after infection before symptoms appear. Treatment at this stage is far more frequently successful than later, and when successful, is far more complete, since no destruction of tissue has taken place, and there has been no sputum containing bacilli to infect others.

To secure diagnosis and treatment at this stage, it is essential to enlist the co-operation of the people, and this can only be attained by education and by an organisation of methods most carefully adapted to the conditions and habits of their lives.

It must now be clear that prevention, diagnosis and treatment, and the economic and social conditions of the community are to be considered in definite relation to each other, in order that the good effect of one line of action is not overbalanced by unnoticed evil consequences in another direction, and that the co-ordination of each part of the scheme with the rest is practicable.

To limit the possibilities of infection from infective cases the following measures must be considered:—

1. The provision of hospital accommodation for advanced cases during such periods as they are in need of nursing.

There is no doubt that the great majority of these would willingly avail themselves of such provision under certain conditions:—

(a) The best possible treatment must be provided.

(b) It must be entirely removed from all connection with the Poor Law for those cases who would not have needed such provision but for illness.

(c) It must be within easy reach of the patient's family.

2. The supervision and education in methods of preventing infection of all chronic cases who are fit to be about, and whose work and home conditions are such as not to necessitate exposure of others to infection.

Treatment at a dispensary renders the supervision and education effective in many cases.

3. The provision of labour colonies for chronic cases during periods when they are unable to obtain suitable work and home conditions.

4. Compulsory measures for dealing with those cases who, either through selfishness, carelessness, or by the indecision and irritability sometimes caused by illness, are unwilling to take any steps to protect those in contact with them.

It is possible to safeguard such measures against abuse, and experience has shown that they are necessary to deal with a certain small proportion of cases who are the most prolific sources of infection.

Alongside of these measures, which cannot be completed and made effective in a day, it is of the greatest importance to cut short the supply of infective cases by curing all who are tuberculous before they reach that stage. Since the diagnosis of active tuberculosis is difficult and uncertain at the stage when complete cure is most readily attained, and there is no known method of measuring the resisting power of the victim, it becomes necessary to find a method of treatment which can be applied without great objection to all

suspicious cases without waiting for proof that cure by natural means was unlikely.

It is impossible to persuade large numbers of these early cases to undergo treatment unless we can offer them one that is simple, cheap, effective, and not likely to interfere with home life and work.

Tuberculin treatment owes its great importance to the fact that it claims to meet this requirement, and though proof cannot be given of its value in any particular case at the early curable stage of the disease, a large number of cases observed over a period of some years will in time determine the position it should hold in the scientific control of tuberculosis. The theoretical ground on which complete success in early cases has been anticipated is the relationship of tuberculin stimulation to the natural cure of the disease, and, as in the case of natural cure, tuberculin can apparently only stimulate the production of immunity after infection has occurred. It is strictly limited in its action when the power of response possessed by the victim has already been overtaxed, and it cannot replace destroyed tissue.

The importance of a method of treating early cases which is found to be applicable as well as effective when given at home and at work, can be illustrated by the comparison of a given number advised to undergo such treatment with the same number of similar cases advised to go to a sanatorium.

Nearly all those who show suspicious symptoms submit to treatment if attention be paid to their convenience in obtaining it at home, and those who hesitate can be finally persuaded the moment they show more definite need. The total cost, even if extra sanatorium treatment be required for a few, is quite moderate, and so far the results obtained have been entirely satisfactory. Experience shows that if a similar series would go to a good sanatorium the results would also be satisfactory, but it is impossible to send all while the diagnosis is doubtful, and many refuse to go until they reach a stage when cure is unlikely. It must never be forgotten that to postpone treatment till tubercle bacilli can be demonstrated is to allow the patient to become infective and lung tissue to be destroyed, while it is impossible to insist on prolonged expensive treatment and cessation of work unless it can be proved to be necessary.

The tuberculin dispensary is a practical method, even if it prove to be a temporary

one, of offering these cases treatment, while at the same time many advanced cases can also be dealt with.

Suitable treatment for every case at every stage can be arranged for at such a centre, with the co-operation, so essential in a chronic infective disease, of trained health visitors and social workers through whom the all-important conditions of environment may be improved.

While it is not essential that tuberculin treatment should be confined to the dispensary, or be the only treatment given there, since its use may become more general, or be superseded by a still more effective remedy, it has been found in practice to be an invaluable asset to the dispensary at this stage of organisation.

It is through the apparent immediate success of the tuberculin treatment that it has been possible to attract to dispensaries at an early stage of the disease many tubercular cases who could not readily obtain the treatment (medical, hygienic, and economic) that was necessary, and so to co-ordinate for their benefit all the available resources for this purpose at a minimum expenditure.

It is because we are dealing with an infective disease that some centralisation is needed, and it is round a centre for active treatment that this can best take place. The sanatorium did not fill the need because it was not in touch with the patients' homes, and because it was not available for the majority of cases needing it.

Sanatorium treatment, and other methods also, are still necessary for a certain proportion of cases, and it is through such a centre as the dispensary that these cases can best be selected.

For the correct organisation of such methods, still more for the effective application of them to the individual patients, the sciences of sociology and psychology must both be studied.

As so often happens in the organisation of a social necessity, voluntary effort paved the way, and it has been felt by many that matters concerning such close intimate relationships as the performance of this work involves, affecting the whole family life and plans of the patients, could be dealt with more satisfactorily on what is called the voluntary basis than by a bureaucratic organisation.

The difficulty lies in the complications already described. The infectivity of the

disease requires a general and unfailing scheme such as voluntary work has rarely been able to supply unaided, and is still less likely to carry out in the present wave of fear of infection. It is no doubt this which has led to the national adoption of a scheme under official control. It must be remembered, however, that the door has been left open at every turn to co-operation.

The politician, national and municipal, begins to realise that bad housing, bad conditions of employment, dear food, and ignorance are the causes of much loss of life from tuberculosis, and must be remedied before it is worth while to spend lavishly on the treatment of the disease which they foster.

The educationalist is reconsidering the conditions that are now forced on the majority of children in the light that has been thrown on the part played by tubercle among them, since it has long been known that bad ventilation, fatigue, and infection by certain other diseases, especially some of those common in childhood, have a most unfavourable influence on this complaint.

Open-air schools in the towns and residential country schools for delicate children must be considered with a view to maintaining the stamina of the town population, and producing that complete recovery from infection in childhood which may lead to the development of immunity.

But it is impossible to wait for the attainment of ideal conditions for all, and the community has undertaken to provide treatment for the present sufferers.

It rests with the voluntary worker to co-operate so that treatment may be brought into a relation with the patient's life which can render it effective.

This adjustment of the treatment to the family conditions depends on two things. First and foremost, on the spirit in which the patient is treated, a spirit which can only be right if the workers are working with a sense of vocation that can neither be paid for in money nor produced to order by technical qualifications, and which alone can secure the co-operation of the patient, so essential to cure. Second, on a training and experience in social work and in working-class conditions, without which even the right spirit of work may fail and flounder helplessly in the bog of cross purposes, misunderstood motives, alien habits.

It is this training and scientific method which can safely direct the course of the philanthropist when his desire to help his neighbour leads him to the necessity of interference in the complicated issues of family life, just as it is philanthropy alone which can permit the thought of such interference.

To provide good houses does not improve the conditions of those who do not know how to live in them. To offer early diagnosis is useless for those who are too selfish or too cowardly to face the truth, and there is as yet no treatment to cure those who are too idle and careless to make the effort necessary to receive it.

The sanitary authority which provides for the cure of a child suffering from diphtheria, and sends it home free from risk of infecting others, interferes little with the life and plans of the family concerned, and if the parents pay more than they can afford and the others go short, or less than they should and learn the art of avoiding their proper obligations, it is never brought home to those responsible for the control of diphtheria. This is not so with tuberculosis, where the scientific methods of prevention, treatment, and social control are so closely interwoven that a sociological mistake comes home to roost with its medical perpetrator as certainly as does an error in diagnosis or treatment.

DURHAM COUNTY COUNCIL EDUCATION (MEDICAL) DEPARTMENT.—In his report for 1911, Dr. Eustace Hill, the school medical officer, submits the reports on school medical inspection made by the medical officer of each of the three districts into which the county is divided, limiting his own remarks to matters affecting the education area generally. It is noted that great improvements have been made "not only in the sanitary state of school buildings, but also in the personal cleanliness of the children, and that the work of school medical inspection is generally appreciated, both by the teachers and parents." The proportion of the latter who attended the inspections decreased from 13.9 per cent. in 1910 to 12.9 in 1911, and the number of objections to inspection from 214 to 120. Excellent work was performed by the three school nurses in following up defective children, and carrying out "head-to-head" inspections with the object of stamping out verminous conditions. During the year scabies was found to be extremely prevalent, but the number of cases of ringworm, regarding which a special card was issued, considerably diminished. The proportion of children found to be suffering from tuberculosis was 0.6 per cent. of those examined, the figure for lung tuberculosis being 0.2 per cent. Amongst the medical reports is one by Dr. Paterson, the school ophthalmic surgeon. The school nurses also report, each separately.

THE AGGLUTINATION TEST IN RELATION TO TYPHOID FEVER.*

By J. F. MACDONALD, M.D., D.P.H.,
Medical Officer of Health, Rural District of Auckland.

THE agglutination test is not only of interest from the bacteriological and clinical points of view, but also from the epidemiological.

I shall deal with the subjects from these three points, and hope to learn much from the discussion which, I trust, will follow.

To obtain from a case the necessary specimen of blood to carry out the test is generally an easy matter, but with a fretful anæmic child, especially in the presence of the mother, the operation becomes an ordeal. Instead of a needle, I prefer to obtain a sharp broken edge on the capillary tube by inserting a pin into the bore of the tube, and moving it to one side (the tubes are sterile, and the pin can be heated in a flame). With such an instrument I have on more than one occasion obtained a specimen of blood from the ear of a sleeping child without waking him (I don't think there is much fear of leaving any glass in the wound).

Culture and Medium.—It is well known that these influence the result—some cultures are preferable to others; for instance, organisms recently isolated from a typhoid patient do not, as a rule, produce a suitable culture for carrying out this test. On one occasion I have seen such organisms responding to six known tests for typhoid bacilli, but still showing no agglutination with serum known to cause agglutination of typhoid bacilli. This culture, after growing for a few days longer on agar medium, responded to the agglutination test. Cultures growing on solid media are preferred to those in fluid media, the reason being that the agglutinable substances of the bacilli will diffuse more readily in a fluid medium. Fluid cultures should only be used when young. The temperature under which the culture grows is also of importance.

In carrying out the test a control should always be set with normal serum or broth, and, as the laboratory culture might alter in its agglutinable properties from some unknown cause, it is well to be sure that the culture shows clumping with known typhoid serum.

Dilution.—The usual dilutions are 1-20, 1-30, 1-50, 1-100, and 1-1,000; with the lower dilution, as a rule, agglutination appears earlier. Sometimes the reaction is absent with

* Read at the April meeting of the Northern Branch of the Society of Medical Officers of Health.

a low, although present with a higher. Personally I have not observed this phenomenon, but Emery states that he has observed three such cases, and he believes that it is a source of error often overlooked. Dr. Scott, Bacteriologist to the Colony of Jamaica, in his recent report states that he has observed this phenomenon 19 times out of 1,500 consecutive examinations; of these 19 patients 14 were under 12 years of age, while only one was over 18.

The Time of Illness at which the Reaction can be obtained varies in individual cases. At the onset there is a negative phase, followed by a positive, which in most cases becomes most marked towards the end of the first week; but it is not uncommon to find cases of typhoid fever in which the reaction is not got until the third week, and I once had under observation a typical clinical case of typhoid fever whose serum was never able to agglutinate typhoid bacilli even in a dilution of 1 in 20. In this case seven different strains were tried, one of them being that isolated from the patient's own urine. Scott, in his report referred to, states that he observed in cases whose serum early in the disease was able to agglutinate typhoid bacilli were mild cases, whereas those in which the reaction appeared late were severe. I have not observed such a connection, and the above case in which the reaction was absent throughout the whole illness was comparatively mild.

Other Organisms Agglutinated by Serum from Typhoid Patients.—These are Coli, the paratyphoid, etc. This is what is known as a group reaction; but it might be remarked that these organisms are only agglutinated, as a rule, in low dilutions, unless, of course, there is a mixed infection present.

Diseases Other than Typhoid Fever in which the Reaction is Present.—At one time it was considered that by the agglutination test it was easy to distinguish between typhus and typhoid; but it is now known that not unfrequently the serum from a typhus patient agglutinates typhoid bacilli even in a dilution of one in 1,000.

Serum from tubercular meningitis cases sometimes agglutinates typhoid bacilli; but, as a rule, it is a partial reaction. I have observed six such cases (the diagnosis was verified by autopsy), and, as such cases can resemble typhoid so closely, there is little to be gained by the agglutination reaction being notified as such, especially where the agglutination reaction is present.

Of other tubercular cases, Roth, who examined sera from 100 cases of severe pulmonary tuberculosis, only found five that gave the reaction in a dilution of 1 in 50, and one in a dilution of 1 in 200; the latter case had an attack of influenza five years previously, and there is, at least, a suspicion that this might have been an attack of typhoid fever.

It is well known that serum from cases of food poisoning in the acute stage of the illness is able to agglutinate typhoid bacilli. The only case I observed whose serum gave the reaction was a patient who had partaken of tripe that was not above suspicion; severe vomiting and diarrhoea set in shortly afterwards. The agglutination reaction was only present for two days—i.e., period of the acute stage of the illness.

Other conditions in which the reaction is present are cases who had typhoid vaccine administered to them, or previously suffered from typhoid fever. Personally I had typhoid vaccine, and the last time examined, my serum was able to agglutinate typhoid bacilli in a dilution of 1 in 1,000 (128 days after the first inoculation).

Duration of Reaction.—This varies according to the individual. It is well known that with some a reaction can be obtained many years after they have recovered from typhoid fever, while others do not show a reaction even during the convalescent period of the disease. In one such case I had under observation the reaction was marked until the temperature became normal when the test proved negative, and remained negative until the onset of a relapse, when the reaction was again obtained, on the first day of the temperature going up. The reaction continued during the febrile period, but again became negative on the temperature becoming normal. The negative during the period before the relapse was not a negative phase of the degree of agglutinability, which sometimes appears before a relapse, and by which it is said a relapse can be predicted, because in this case the test proved negative the second time the temperature became normal, after which the patient made a good and speedy recovery.

Six months after a milk epidemic, I was able to procure a specimen of blood from 20 different individuals whose blood six months previously was known to have given a marked reaction with the ordinary laboratory cultures. Each specimen was tested with seven strains, and also in different dilutions. For the

Initials.	Age.	Dilution.	STRAINS OF BACILLI.							SEVERITY OF ATTACK.
			1	2	3	4	5	6	7	
D. G.	4	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	†	*	o	o	o	o	o	Mild Case.
"	"	"	o	*						
J. G.	14	$\frac{1}{50}$ $\frac{1}{100}$	†	†	†	†	*	†	*	Moderately severe. Temperature normal in 4 weeks.
"	"	"	o	o	o	o	o	o	o	
J. M.	19	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	†	†	†	†	†	†	†	Mild, but developed a fistula in ano.
"	"	"	*	†	o	o	*	o	*	
J. C.	26	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	†	†	†	†	†	†	†	Very mild.
"	"	"	o	*	o	o	o	o	o	
K. O.	7	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	*	†	*	*	†	†	*	Mild. Temperature normal in third week of illness.
"	"	"	o	*	o	o	o	o	*	
C. H.	17	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	†	†	†	*	o	*	*	Moderately severe. Temperature normal on the twenty-fifth day of illness.
"	"	"	o	†	o	o	o	o	†	
J. H.	13	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	*	*	o	o	o	o	*	Moderately severe. Temperature normal on the thirty-third day of the disease.
"	"	"	o	*	o	o	o	o	o	
E. H.	14	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	†	†	*	*	†	*	*	Moderately severe, temperature becoming normal on the twenty-fifth day of the disease.
"	"	"	o	o	o	o	o	o	o	
R. B.	16	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	†	†	o	†	*	*	†	Moderately severe, temperature becoming normal on twenty-third day, complicated with thrombosis of left femoral vein.
"	"	"	o	†		o	o	o	o	
J. B.	19	$\frac{1}{50}$ $\frac{1}{100}$	o	o	o	o	o	o	o	Moderately severe, temperature becoming normal on twenty-seventh day.
"	"	"	o	o	o	o	o	o	o	
M. H.	19	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	†	*	†	o	o	*	*	Fairly mild, temperature becoming normal on the twentieth day of the disease.
"	"	"	†	*	o			o	o	
J. D.	16	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	†	†	†	†	†	†	†	Severe case, temperature becoming normal on the thirty-fifth day of the disease. Complicated with Bacteriuria and Hæmaturia.
"	"	"	*	†	o	*	†	†	*	
B. W.	8	$\frac{1}{50}$ $\frac{1}{100}$	o	o	o	o	o	o	o	Severe, temperature becoming normal on the twenty-eighth day of the disease. Complicated with middle ear disease (bilateral).
"	"	"	o	o	o	o	o	o	o	
G. W.	14½	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	*	†	*	*	†	*	†	Very mild, temperature becoming normal on the fourteenth day of the disease.
"	"	"	o	†	o	o	o	o	*	
I. W.	7	$\frac{1}{50}$ $\frac{1}{100}$	o	o	o	†	†	†	o	Fairly mild. Temperature normal on the seventeenth day of disease.
"	"	"	o	o	o	o	o	o	o	
J. W.	10	$\frac{1}{50}$ $\frac{1}{100}$	o	o	o	o	o	o	o	Very mild case, temperature becoming normal on the sixteenth day of disease.
"	"	"	o	o	o	o	o	o	o	
A. G.	12	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	o	†	o	o	o	o	o	Mild case. Temperature normal on the seventh day of illness. Slight relapse.
"	"	"	o	*						
R. G.	6	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	o	†	o	o	o	o	o	Fairly mild case. Temperature erratic, but normal in tenth day of disease. Temperature up again on five or six occasions to 100 F., coming down within ten hours. Small abscess.
"	"	"	o	*						
L. G.	8	$\frac{1}{50}$ $\frac{1}{100}$	†	o	o	o	†	o	†	Very severe case, with consolidation over base of left lung. Temperature normal on the twenty-seventh day of disease.
"	"	"	o				o		o	
J. M.	14	$\frac{1}{50}$ $\frac{1}{100}$ $\frac{1}{1000}$	*	*	†	†	†	†	†	Severe, temperature becoming normal on twenty-fifth day of illness. Complicated with Bacteriuria and Tympanitis.
"	"	"	*	*	*	o	o	o	*	
"	"	"	o	*	o	o	o	o	o	

NOTE.
o=No reaction.
Blank=Not tested.
*=Slight reaction.
†=Fair reaction.
‡=Marked reaction.

In 2 hours.

opportunity of obtaining these specimens I am indebted to Dr. Wilson, County Medical Officer of Lanarkshire, and for the actual testing to Dr. Patterson, Bacteriologist to the Lanarkshire County Council.

The results were rather conflicting. In some the reaction was fairly regular for all the strains and dilutions, but in others the reaction was present with certain strains and absent in others.

The clinical notes taken showed no connection between the severity of the illness and the duration of the reaction.

The table shows the result of the tests in detail and summary of the clinical notes.

A large number of chronic "carriers" give a marked reaction. The serum from some apparently healthy individuals, who never from their own knowledge suffered from typhoid fever, sometimes give a reaction, but we know now that a person can suffer from typhoid without any apparent symptoms—those known as the "symptomless" cases of typhoid fever.

Eccard (1910), in carrying out his investigations for "carriers" among those who had previously suffered from typhoid fever, found that with persons on the onset of symptoms of intestinal disturbances, such as vomiting and diarrhoea, the reaction would be present even in a dilution of 1 in 100, to disappear again with the symptoms.

Value of Test.—For diagnostic purposes, if rightly interpreted, the test is of the utmost value, but I am afraid that medical practitioners are inclined to lay too much stress upon a negative result, especially in the early stages of the illness. I have known a negative result on more than one occasion indirectly causing the true nature of the illness to be overlooked; such occurrences are, as a rule, due to an error of judgment rather than to the unreliability of the test.

If the agglutination reaction is present in connection with an individual who recently suffered from an indefinite illness, and which the epidemiologist suspects might have been enteric fever, the suspicion almost becomes a certainty, provided the few exceptions mentioned above are excluded.

In connection with two cases of enteric fever removed to hospital, I warned the hospital staff that although these cases were mild, with a normal temperature at the time, still in each case the agglutination test proved

positive, and I considered them enteric fever. Within two weeks these cases were discharged, as the hospital authorities were satisfied they were not enteric. One subsequently developed neuritis and the other a relapse. Another instance was as follows:—A case admitted with the agglutination test positive, temperature normal; the hospital staff discharged the patient within a fortnight, but within two days the case had to be removed again with a severe relapse, which proved fatal. If the agglutination test is fully taken advantage of, and rightly interpreted, such occurrences should be almost unknown.

OBITUARY.



THE LATE PROFESSOR THEODOR WEYL.

WE much regret to have to record the death, on June 6th, of Professor Theodor Weyl, who was an Honorary Fellow of the Society of Medical Officers of Health, and well known to medical men in this country for his work in varied problems connected with chemistry, bacteriology and hygiene. Professor Weyl was born in Berlin in 1851, studied in Heidelberg, Berlin and Strassburg, working under Du Bois-Reynard and Hoppe-Seyler. Devoting himself at first to physiological chemistry, he later became associated with Koch in a series of researches in connection with tuberculosis, cholera, typhus, water purification, etc. Dr. Weyl was the author of many standard works on hygiene and on chemistry, his *Handbuch der Hygiene* being looked upon as an invaluable work of reference both in Germany and in this country. As secretary for many years of the Berlin "Verein für öffentliche Gesundheitspflege," he rendered valuable service in the advancement of public health in Germany.

NOTES ON TWO SERIES OF TYPHOID FEVER CASES DUE TO CARRIERS.

By T. W. BEAZELEY, M.B., D.P.H.,
Assistant Medical Officer of Health, Birmingham.

SINCE the possibility of typhoid fever being conveyed by "Typhoid Carriers" has been recognised, many outbreaks of the disease have been recorded which have been traced to such persons, and it may be of interest to report the two following series of cases which have recently been investigated in Birmingham, and which were undoubtedly due to carriers.

SERIES No. 1.

Between January, 1911, and November, 1912, a number of cases of typhoid (9 in all) occurred in and about — Court. The dates of these cases were as follows:—

Jan. 24th, 1911, I.C. F. aged 6.	No. 50	— Road
Feb. 21st, " A.P. F. " 12.	" 7	— Court
Nov. 17th, " J.W. M. " 21.	" 19	" "
Dec. 22nd, " E.W. F. " 19.	" 19	" "
Feb. 5th, 1912, T.D. M. " 32.	" 20	" "
Feb. 21st, " E.S. F. " 14.	" 10	" "
June 4th, " T.P. F. " 28.	" 18	" (died).
Oct. 5th, " M.R. F. " 13.	" 19	" "
Nov. 28th, " W.G. M. " 32.	" 8	" "

In February, 1912, after the notification of the sixth case (E.S.) it was suspected that these attacks were caused by a typhoid carrier, and an attempt was made to trace the origin of them. The persons, who it was then thought might be the disease carriers, were I.C. or A.P. (the first two cases) or T.S., the father of the sixth case (who was said to have had typhoid in South Africa in 1901).

No other people could be found in the Court who had previously suffered from typhoid. Specimens of urine and faeces were obtained from these three persons, and submitted to examination at the University, but gave a negative result, and no light could thus be thrown on the outbreak.

The circumstances attending the occurrence of the eighth case (M.R.), who apparently contracted the disease at No. 19, fixed suspicion on this house, the occupants of which are Mrs. W., her son J.W., a lodger, and the girl M.R. On careful enquiry it was found that all the above patients could be traced directly or indirectly to this address.

- 1.—I.C. was a granddaughter of Mrs. W., and had frequently visited No. 19.
- 2.—A.P., a school-mate of I.C., visited Mrs. W.'s house with her.
- 3.—J. & E. W., children of Mrs. W., lived in her house at the time of their attacks.
- 4.—T.D., a son-in-law of Mrs. W., living next door, frequently visited No. 19.

6.—E.S., did errands for Mrs. W., and about the time of her illness was in the habit of using the W.'s W.C., as their own was out of order during the frosty weather.

7.—T.P., a next-door neighbour, was frequently visiting in Mrs. W.'s house.

8.—M.R. had only lived at Mrs. W.'s for a month when she contracted typhoid. She had been sleeping during this month with Mrs. W.

9.—W.G. is another son-in-law of Mrs. W., and just before the onset of his illness had been having his meals in Mrs. W.'s house on account of his house-keeper being away in hospital with scarlet fever.

Having traced the source of illness to this house, the question then arose as to which of the occupants was responsible for it. J.W. and M.R. being victims were unlikely, and the lodger, who had only been there since May last, *i.e.*, after the occurrence of the sixth case of the series, could be eliminated.

This left only Mrs. W., an elderly woman of 53, from whom no definite history of previous typhoid could be obtained. She alleges that she had a severe illness two or three years ago, which lasted for some months, and she has also had several other illnesses, but none which she had been told was typhoid. There is no history pointing to biliary-colic, jaundice or gallstones. A Widal test was made from her blood, but this gave a negative result. Next samples of her urine and faeces were submitted to examination; the urine was found to be negative, but typhoid bacilli were found in the stools, thus making it most probable that she was the cause of all these cases of illness.

Dr. Lewis's report on these examinations was as follows:—"I have to report that in this case I have found the typhoid bacillus in the faeces, but not in the urine. Its identity has been established not only by cultural tests in which it gives the typical reactions, but by agglutination tests with anti-typhoid serum. The reaction is positive even at a dilution of 1-10,000, and in intensity compares well with a similar reaction produced by the laboratory stock cultures of *Bac. Typhosus*."

SERIES No. 2.

On October 13th, 1912, S.M., of — Road, was notified as suffering from typhoid.

On enquiry it was found that the family had lived at various addresses during the last five years, and that four other members had previously suffered from typhoid at the dates specified:—

Address No. 1, Mrs. M.	had typhoid in Oct., 1907.
" " 2, " "	" " " " " " 1909.
" " " " " "	" " " " " " (2nd attack).
" " " D.M., aged 11, M. "	" " " " " " Dec., 1909.
" " " E.M., " 2½, M. "	" " " " " " " "
" " " 3 (No cases happened here).	" " " " " " " "

Address No. 4, J.M., aged 14, F. had typhoid in Dec., 1910 (Died).
 " " 5 (No cases happened here).
 " " 6, S.M., aged 12, M. had typhoid in Oct., 1912 (Present case).

The father and three other children of this family have not had typhoid.

No other cases of typhoid are known among the acquaintances and relatives of this family and Mrs. M. (the mother) being the first case of the series, and having had two attacks of typhoid, was at once suspected of being the source of the disease among the other members of the family. A Widal test was done and this proving positive, a sample of faeces and urine was obtained and submitted to examination. The urine gave negative results, but the faeces showed the presence of living typhoid bacilli.

Dr. Lewis reports on these specimens as follows:—

"I have to report that the typhoid bacillus is present in this case in the faeces, but that it was not found in the urine. The identity of the bacillus has been proved by the same tests as in the case of Mrs. W., and the bacillus gives a positive agglutination reaction with serum diluted to 1-10,000. This reaction is quite as good as the similar reaction with a control culture of *Bac. Typhosus*."

It has long been known that some persons after an attack of typhoid fever may harbour the living typhoid germ in the intestinal tract or elsewhere for a long period afterwards, and by this means may cause typhoid in others even years after their own illness. It has also been noticed that these known "carriers" do not often infect a large number of other people, and even these at varying periods—it may be only at intervals of several months or years, as the carrier is only infective at certain times. For these reasons the existence of a carrier is often overlooked and not suspected unless several cases occur in the same family.

It is an interesting fact that the whole of the cases in the second series, and all but one in the first series, have occurred between the months of October and February—the period at which typhoid is usually most prevalent; but it is perhaps impossible to draw from this in such a small number of cases any conclusion bearing upon the well-known autumnal rise of this disease.

Carriers having definitely been found, steps must be taken to avoid as far as possible any further spread of the disease. It is impracticable to compulsorily isolate carrier cases although they are known, and have proved themselves

to be infectious to others. All that can be done is by means of advice and persuasion.

The cases have been interviewed and certain simple rules (as suggested by Dr. Ledingham in his report to the Local Government Board on typhoid carriers) have been drawn up, typed and given to them, on the rigid observance of which depends the safety of not only their own families, but also of other members of the community. The chief points these rules are intended to impress are:—

- (1). The necessity of observing scrupulous personal cleanliness, particularly of the hands.
- (2). Proper disinfection of soiled linen and disposal of stools, etc.
- (3). To avoid as far as possible the handling of foodstuffs, either for home use or for sale of such.

The following is a copy of the instructions issued:—

RULES TO BE OBSERVED BY TYPHOID CARRIERS.

INFECTION occurs most frequently by the hands, which are readily contaminated during defaecation and urination.

INFECTION may also be spread by soiled body and bed-linen.

The germs get transferred from the unclean hands to other persons either by direct contact or by indirect contact, e.g., with foodstuffs and various objects used by other persons.

CARRIERS may avoid infecting other persons or themselves by taking the following precautions:—

- (a). The carrier must always exercise the greatest cleanliness.
- (b). Hands should be thoroughly washed on getting up in the morning, before every meal, and before touching food or drink (especially milk).
- (c). The carrier must, after using the water closet or urinal, cleanse the hands thoroughly with soap and water, or with a disinfectant. There should always be a sufficient quantity of closet paper in the water clo. et.
- (d). The carrier must use his own towel, which no one else may use.
- (e). The carrier's dirty body and bed-linen should, before washing, be dipped in Izal Solution (1 part of Izal in 100 of water).
- (f). The carrier should, as far as possible, avoid taking part in the actual preparation of food, or in handling foodstuffs for sale.

I am indebted for permission to publish these notes to the kindness of Dr. Robertson, medical officer of health, Birmingham.

UNIVERSITY OF MANCHESTER.—The following candidates at the July Examination obtained the Diploma in Public Health of the University of Manchester:—Pollok Donald, M.B., Ch.B.; Annie C. Greenep, M.B., Ch.B.; A. W. Laing, M.B., Ch.B.; A. R. M. McIlraith, L.R.C.P., L.R.C.S.; Marion Stocks, M.B., B.S.; H. G. Trayer, M.B.; A. G. Wilkinson, M.B., Ch.B.; G. G. Wray, M.B., Ch.B.

THE PROGRESS OF PUBLIC HEALTH IN GERMANY.*

THIS supplement consists mainly of abstracts of the more important international public health literature of 1911. As an introduction tables are given of the international health statistics for 1909. These are already familiar to many and need only brief reference. Thus the very high proportion of illegitimate births in Germany, reaching 9.01 per cent. of the total births, may be contrasted with 4.1, the corresponding figure given for England and Wales. It is also of interest to note that the German infantile mortality, previously higher in town than in country, had in 1909 had this order reversed, probably as a result of the relatively rapid improvement in the conditions of town life. The German infantile mortality rate of 170 per 1,000 births in 1909 compares unfavourably with 109, the corresponding rate for England and Wales. On the whole the tables leave the impression that, whatever may be the failings of the public health system of this country, its results compare favourably with those of other lands.

It is impossible here to make more than a passing reference to the admirable collection of already much condensed *précis* which fill the remaining five hundred odd pages of the volume. They are classed according to subjects—infectious diseases, tumours, animal diseases, school hygiene, care of the feeble-minded, etc.—and reference and cross-reference are facilitated by a good index of authors and of subjects.

In the section on tuberculosis, an official report for Bavaria advocates a wide extension of the system of dispensaries as the cheapest and most efficient centres for administration. Jacob (Berlin), however, expresses the opinion that the system of tuberculosis dispensaries is not suitable for country districts, where he considers that the disease can be controlled only by visits to the homes.

In the section on tumours, Braunstein maintains that the spleen has an inhibitory influence on the growth of neoplasms, as shown by (a) the rarity of secondary deposits in the spleen, (b) the involution of portions of tumours grafted on to that organ, (c) the great immunising power of emulsion of spleen against malignant growths, (d) the death of animals grafted with foreign tumours after splenectomy, and (e) the capacity of the spleen to manufacture antibodies against bacteria or non-bacterial substances.

The section on school hygiene is of special interest. It is clear that in uniformity of administration Germany, which has taught so much in school hygiene, has also something to learn from this country.

*Deutsche Vierteljahrsschrift für öffentliche Gesundheitspflege. Supplement to vol. 44, 1913.

Doernburger (Munich) quotes the following among other suggestions of a special commission with regard to the proposed appointment of school doctors to secondary schools in Bavaria:—That the school doctor should have no powers of administration or of treatment, but should act only in an advisory capacity; that visits to the homes should not fall within his province; and that he should have a place and a voice in conferences of teachers in matters relating to school hygiene.

Referring to the dental treatment of school children, Kirchner (Berlin) urges the need for systematic examination of the teeth of all children as soon as possible after admission to school, with preparation of a dental chart of each child, and re-examination at least every six months. This work and the subsequent treatment in cases should, where the child does not already attend a dentist, be carried out by a specially appointed school dentist.

The supplement here very briefly described is of general interest and will repay more careful study. It is useful as a work of reference.

CITY OF LEEDS.—Dr. Cameron, in his report for 1911, provides, as usual, a most careful analysis of the work done by his staff, and gives a vast amount of most valuable statistical information. In addition to a number of tables in the text, nearly one-third of the total number of pages is occupied with tabular statements relating to the work of the veterinary and other inspectors. Dealing with the question of the high infantile mortality rate recorded in 1911—nearly 160—he expresses the opinion that Leeds has not given so much attention to the control of the death-rate amongst young children as she should have done. He considers that more women inspectors are required, and shows that he has pointed this out on more than one occasion. Under the heading "Work of the Women Inspectors" the lines along which progress could be made if more women were appointed are indicated. In connection with housing also and the work of the development committee, which has this matter in hand, and has given considerable attention to it, complaint is made of the unsatisfactory nature of the existing arrangements, and the suggestion offered that a special assistant for housing purposes should be provided. Dr. Cameron reports very fully with regard to tuberculosis. Though a very great deal is done for the consumptive in Leeds, it is considered that more sanatorium beds and a larger tuberculosis dispensary are required. The figures with regard to the work of the nuisance inspectors and the special inspectors and the comments thereon show that a great amount of routine work was done in the period reported upon.

REVIEWS.

PREVENTION AND CONTROL OF DISEASE. By Francis Ramaley, Ph.D., Professor of Biology in the University of Colorado, & Clay E. Giffin, B.A., M.D., Instructor in Surgery in the University of Colorado, pp. 386. Illustrated. Boulder, Colorado, 1913.

The object of this work is to promote the more general appreciation of the public health work of laboratory investigators, physicians and officials, and to arouse a more general desire to co-operate in its extension. The writers point out that the book has not been written for medical men, or even for medical students; it is a book for the lay reader, uninformed in the principles and practice of preventive medicine and practical sanitation. It is therefore from the standpoint of its value as an educational factor in the hands of the lay reader that the book must be judged.

Well-written and instructive as the book is, we must confess to some doubts as to whether it will prove very successful in its object. It is no easy matter to write a Popular Educator in Hygiene; to appeal and to produce results the treatment of the subject must be well balanced, to the point and convincing, and it must be full of that practical advice which is serviceable to "the man in the street." The work under review falls somewhat short of these requirements. While very brief and elementary in parts, the treatment in some places is unnecessarily lengthy and advanced. For instance, while there is nothing about infant feeding and certain other important matters that the general public should know about, a great deal upon immunity is given, including Ehrlich's "side-chain" theory. On the other hand, sound advice is offered even on such subjects as arteriosclerosis and kidney disease, and the treatment of the subject of tuberculosis is excellent. There is too much of parasitology and bacteriology and too little of practical sanitation—the causes of disease are very fully gone into but not sufficient is given of detailed practical advice that can be applied in the home and in the workroom. "Before the close of the fifth year of life most children have learnt something about sexual matters from their companions. They would be better taught the truth by their own parents." Is it suggested that a child should be informed on these matters at the early age of five?

TUBERCOLOSI ED EVOLUZIONE SOCIALE. By Giuseppe Sanarelli, Professor of Hygiene, University of Bologna. Treves Bros., Milan, 1913.

In this work Professor Sanarelli has dealt with the social aspect of tuberculosis on novel and interesting lines.

His main thesis is that the diminution in the death-rate from tuberculosis generally experienced is due neither to the elimination of susceptible stocks nor to the removal of sources of infection, but that an immunisation on a large scale has occurred, due to quite different causes.

On the basis largely of Mafucci's work on rabbits and on fowls, corroborated later by that of Maragliano, of Ferran, and of Chabas, Sanarelli maintains the view that an active immunisation of the individual follows inoculation with a dose of tubercle bacilli so small in amount that the tissues can overcome the invasion successfully; and further that this immunity can be, and is, transmitted to some extent through one or more generations. This process of active immunisation, followed by transmission of the immunity in some degree to the offspring, is, in Sanarelli's opinion, the true explanation of the diminution in the death-rate from tuberculosis. Since the possibilities of infection are immensely greater in town than in the country, Sanarelli holds that the increasing immunity is closely related to the increasing urbanisation found in most European countries.

In support of the view that a large proportion of adults have at some time been infected with tuberculosis, and have overcome the infection, Sanarelli quotes the well-known results of the application of the various tuberculin tests.

To illustrate the susceptibility, not of individual stocks, but of whole masses of population which have previously not been exposed to infection by tuberculosis, the author quotes, first, the havoc played by tuberculosis among primitive peoples, such as the Red Indians, Polynesians, and Kalmucks; secondly, its terrible ravages among Italian emigrants to the United States shortly after their arrival in America from the rural districts of Italy; and, finally, the fact that tuberculosis is more rife in regiments recruited from the country than in those recruited from the town, where the soldiers will have come of stock already subjected to the immunising action of tuberculosis. Sanarelli does not, however, in the first two instances given above appear to have laid sufficient stress on the adverse home conditions which may encourage an excessively rapid spread of tuberculosis in primitive nations and amongst poor emigrants.

Using Great Britain as an illustration of his argument, for the unkind reason that the decrease in tuberculosis has been more marked, while the anti-tuberculosis measures are alleged to have been less systematic, than in other European countries, Sanarelli dismisses in summary fashion the various factors which have previously been suggested in explanation of the diminutions in the tuberculosis death-rate, and he concludes that

the real cause is the steadily increasing urbanisation associated with a steadily increasing immunisation of the population. It is interesting to note that the author has scarcely a good word for sanatoria as places of cure, while he altogether ignores the part played by hospitals and other similar institutions in segregating cases of tuberculosis, and so diminishing the sources of infection at home.

Passing from these most suggestive, if not altogether convincing, general considerations to their practical application, Professor Sanarelli recommends in the main two measures for the control of tuberculosis: first, diminution of overcrowding, so that the dose of infection to which individuals in contact with the patient are exposed shall not be too massive for them to overcome; and, secondly, the removal of young children from infected surroundings, and their education under open-air conditions, so that they may acquire immunity by successfully resisting the tubercle bacilli which they have already received. Not a word could be found, even on careful re-perusal, to suggest the need for removal of human sources of infection, and it is significant that the author is not an advocate of compulsory notification of the disease.

These measures appear very inadequate, even if the author's own position as regards immunity be accepted, in view of the practical impossibility, where cases of open tuberculosis are left at home, of so limiting the chances of infection that the rest of the household shall never receive a dose too massive for them to overcome.

Whatever attitude is adopted, however, there can be no question that Professor Sanarelli has done a real service in stimulating thought and in depolarizing current opinion. His book is pleasantly written and well arranged, and each chapter is preceded by a short and useful abstract.

LEITFADEN FÜR DIE ABWASSERREINIGUNGSFRAGE.

By Professor Dr. Dunbar, Director of the Hygienic Institute, Hamburg. 2nd edition, with 257 illustrations, pp. 643. Oldenbourg's Technische Handbibliothek Bd. 17. 1912.

This is the second and considerably enlarged edition of Professor Dunbar's book upon the principles of sewage-purification. It comprises an exceedingly comprehensive and interesting survey of the development of sewage treatment in Europe and in America right up to the present day, and includes a useful chapter upon the disinfection of sewage.

The thoroughly international character of the work gives it a very special value. The author is himself familiar with the many installations and processes which he describes in various lands, and all who are acquainted with the well-known Hamburg experiments, which are of course fully

described, will agree that no one is so well fitted to write a critical survey of this subject as is Professor Dunbar.

The English reader will be particularly interested in the description of the development in Germany on original lines of certain processes, and will also note the author's comments on the comparative absence of purely scientific experimentation in England. It appears that we prefer to unconsciously experiment on a "practical" and exceedingly costly basis! The illustrations in the book are numerous and good.

An English translation of the present edition by Dr. H. T. Calvert, who translated the first edition, will shortly appear, and should be very welcome.

CORRESPONDENCE.

The Editor does not accept responsibility for the opinions of correspondents.

To the Editor, PUBLIC HEALTH.

DEAR SIR,—I have been hoping that some discussion would take place, and a report appear in your paper, anent the "Sanatorium Benefits" of the Insurance Act.

I have spoken to many medical men upon the subject, some of them medical officers of health, and one at any rate a recognised authority on tuberculosis, and not one of them has been able to say that he thinks the money that is to be spent on sanatoriums will be worth while. If this be so, is it not the duty of medical officers of health, as a whole, to let the Government know what they think? It seems to me that we are beginning at the wrong end. That though sanatoriums may be beneficial as educational institutions, they are very expensive, and the education could be given at much less cost, and that all our resources should be expended on the origin of the disease, the production of a pure milk supply, compulsory isolation of dangerous cases, tuberculosis dispensaries, open-air schools, and improved housing conditions.

I am,

Yours faithfully,
JAMES MARSH.

Atherton, July 21st, 1913.

MID-DAY MEALS AT SCHOOL.—Many young children bring unsuitable food to school for their dinner; they rarely bring such things as sandwiches or hard-boiled eggs, but jam, pastry, and cake form their mid-day meal. The elder children seem to be better looked after in this respect, and I am pleased often to see such good things as bacon (mostly fat) and home-made bread.—*County of the Isle of Ely, Report of the School Medical Officer, 1912.*

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856. RECONSTRUCTED 1888.
INCORPORATED 1892.

Midland Branch.—The annual meeting of this Branch was held on Saturday, July 5th, at Northampton. Present: Dr. Doig McCrindle (President), Drs. E. D. Parsons, J. M. Cowie, A. J. Jenner, Henry Handford, T. Ridley Bailey, and E. H. Snell.

Prior to the meeting the President entertained the members present to lunch at Franklin's Hotel, Northampton. He then drove the party in motor cars to the County Sanatorium at Creaton (seven miles), calling to view the Welford Road Hospital on the way.

Apologies for absence were received from Drs. J. Robertson, A. Bostock Hill, G. Petgrave Johnson, Henry May, Killick Millard, Philip Boobyer, and J. W. Miller.

The following officers and Council were appointed for the ensuing year:—*President*, Dr. G. Petgrave Johnson; *President-elect*, Dr. J. M. Cowie; *Vice-Presidents*, Drs. Alfred Hill, Henry May, Henry Handford, and J. Doig McCrindle.

Council: Drs. S. Barwise, George Reid, P. Boobyer, Henry Malet, John Robertson, Ridley Bailey, and J. W. Miller; *Treasurer*, Dr. Bostock Hill; *Secretary*, Dr. E. H. Snell; *Representatives on the Council*, Drs. Ridley Bailey and Henry Handford.

A vote of thanks, proposed by the *PRESIDENT*, was passed to the Corporation of Birmingham for lending the Branch a committee-room for the purpose of its meetings.

Dr. Kilpatrick (the Medical Superintendent) and Dr. McCrindle then conducted the party over the sanatorium. The members were then entertained to tea, and afterwards a vote of thanks was passed to Dr. McCrindle for his kind hospitality.

Southern Branch.—A meeting of the Southern Branch was held at the White House, Emsworth, on July 4th, 1913. Previous to the meeting the members (21 in all) were very hospitably entertained to luncheon by Dr. Lockhart Stephens. Present: Dr. J. A. Gibson (President), Drs. Lockhart Stephens, Hugh Stott, W. J. Butcher, C. W. Hutt, R. A. Lyster, J. C. Hoyle, E. A. F. Wilkes, J. Tease, R. W. Courtauld, J. P. Walker, James Fenton, James Fairley, R. E. Lauder, Duncan Forbes, R. Lloyd Legate, R. H. Wilshaw, A. Griffith, W. G. Willoughby, Stewart Norman, and A. Mearns Fraser (hon. sec.); also, as visitors, Mr. H. Hatley (Hants Insurance Committee), and Dr. Glanville.

The minutes of the last meeting were read and confirmed.

Letters of apology for absence were read from Drs. Goodwin, Jackson, A. G. R. Cameron, H. Maturin, R. Maples, and Lockhart Livingstone.

It was proposed by Dr. Willoughby, seconded by Dr. Wilshaw, and resolved, that the following gentlemen, as recommended by the Council, be the officers of the Branch for the ensuing session:—*President*, Dr. Duncan Forbes; *Hon. Treasurer*, Dr. Hugh Stott; *Hon. Secretary*, Dr. J. A. Gibson; *Representative on Council*, Dr. R. E. Lauder.

It was proposed by Dr. Lauder, seconded by Dr. Wilshaw, and resolved, that the following be members of the Council for the ensuing session:—Drs. Fenton, Fraser, Gibson, Griffith, Lauder, Lyster, Norman, Stephens, Stott, Walker, Willoughby, and Wilshaw.

The balance sheet of the Branch for the past year was presented by Dr. Stott, and adopted.

A discussion on "The Administration of Sanatorium Benefit" was opened by Dr. Lockhart Stephens, whose remarks were directed towards the necessity for general co-operation of all officials with general medical practitioners, and he emphasised the great desirability of those directing county schemes, for the administration of sanatorium benefit and for the prevention of tuberculosis, getting the sympathetic co-operation of urban and rural district councils, the medical officers of health of the districts, and the general practitioners residing therein. A very interesting discussion followed, which was taken part in by most of the members present.

The meeting concluded with a hearty vote of thanks to Dr. Lockhart Stephens for his kind hospitality and for his interesting remarks.

LITTLE MOTHERS' LEAGUES IN NEW YORK.

REALIZING that the co-operation of all girls over twelve years of age, many of whom were often the sole caretakers of babies in their families, was an adjunct of immense value, the division made a special effort to increase the number of Little Mothers' Leagues and to broaden their purpose and usefulness. The medical inspectors lectured in each public school upon the subject of infant mortality and the method by which it might be reduced. After the lecture the girls were asked to aid in the summer's campaign. Seventy-one leagues were thus formed, with a total membership of nearly 20,000. The Department provided an equipment for each league consisting of scales for weighing the baby, gas stoves, boilers, dishes, measuring glasses and spoons for demonstrating the methods of milk modification, bottles and nipples for lessons in care and cleanliness, bath tub, bath thermometer, baby clothes, rubber sheeting, towels, boric acid powder, etc., for teaching infant hygiene. A certificate of membership was given to each member of the league and badges were given after six meetings had been attended. During 1911, 239 leagues were formed and 17,050 enrolled.—*Annual Report of the Department of Health of the City of New York for the years 1910 and 1911.*

LAW REPORTS.

HIGH COURT OF JUSTICE.

KING'S BENCH DIVISION.

April 8th, 1913.

BEFORE RIDLEY, PICKFORD AND AVORY, J.J.
ARMITAGE, LTD., v. NICHOLSON.

Nuisance from Smoke—Negligent Stoking of Furnaces—Criminal Liability of Occupier of Premises.

Under the Bradford Corporation Act, 1910, Sect. 53, the occupier of premises is liable to be convicted summarily in respect of a nuisance from smoke due to the negligent stoking of his furnaces by the stokers employed by him.

This was a case stated by the stipendiary magistrate for Bradford on the hearing of an information charging the appellants as occupiers of premises in that city with unlawfully permitting to be used certain furnaces employed in the said premises, such furnaces being constructed upon the principle of consuming and so as to consume their own smoke, and the smoke arising from such premises not being effectually consumed or burnt.

The magistrate found that the appellants were occupiers of a dyehouse and therein employed certain furnaces, such furnaces being constructed so as to consume their own smoke, and would do so unless used negligently. On September 24th, 1912, the appellants permitted the said premises to be used and the smoke coming therefrom was not effectually consumed or burnt, in that smoke was emitted. The cause of such emission was the negligent stoking of the appellants' stokers, and such emission was not due to an accident or to any other cause which could not have been foreseen. Other than such negligent stoking there was no negligent user.

The Bradford Corporation Act, 1910, S. 53, provides:—

"(2) If any person uses or suffers to be used any such furnace which shall not be constructed upon the principle of consuming and so as to consume or burn its own smoke, or if any person using or permitting to be used any furnace so constructed shall in the event of the smoke arising therefrom not being effectually consumed or burnt fail to show that such furnace has not been negligently used he shall if he is the owner or occupier of the premises or a foreman or other person employed by such owner or occupier be liable to a penalty not exceeding five pounds.

"(3) No penalty shall be inflicted if in the opinion of the court the emission of the smoke was due to an accident or to any other cause which could not have been foreseen." The magistrate convicted.

The appellants contended that they could not be made criminally liable under the Act unless they were personally negligent, and relied on the case of *Chisholm v. Doulton* (1889), 22 Q.B.D. 736, a decision under the Smoke Nuisance (Metropolis) Act, 1853.

The Court dismissed the appeal.

RIDLEY, J., in the course of his judgment, said the case was to be distinguished from *Chisholm v. Doulton*, as the words in the two Acts were different. In the Metropolis Act the offence was to "so negligently use" any furnace, and the court there held that the using must be by the person charged. In the Bradford case the words used were different. A person was made liable for permitting the furnace to be used so as to cause smoke. That included the owner, and he had to show that the furnace had not been used negligently. He had not done so and was therefore liable to be convicted.

PICKFORD and AVORY, J.J., concurred.

May 1st, 1913.

RYALL v. KIDWELL & SON.

Housing Acts.—House not reasonably fit for habitation.—Injury to child of tenant.—No claim to recover.

The child of a tenant who is injured by reason of a house not being in all respects reasonably fit for habitation has no claim for damages against the landlord under the Housing Town Planning, &c., Act, 1909.

This was an appeal by the plaintiff from a county court judge in an action brought by the infant daughter of the tenant of a house against the landlords to recover damages for injuries owing to the defective condition of the house. The action was based on Sects. 14 and 15 of the Housing Town Planning, &c., Act, 1909. The county court judge held that the contract was one between landlord and tenant, and that the plaintiff had no cause of action.

The Court dismissed the appeal. The same point had already been decided in the same way by *Banks, J.*, in *Middleton and Wife v. Hall*, ante p. 119, but this case was not cited to the Court.

AVORY, J., in the course of his judgment, said:—"The effect of Section 15 of the Housing and Town Planning, &c., Act was that in the contract between the landlord and tenant there was a term that the premises should be kept by the landlord during the holding in all respects reasonably fit for human habitation, and if there was any room for doubting that the section contemplated a contract between the landlord and the tenant only, he thought that doubt would be removed by a reference to Sub-section 9 of the same Section. This being a contract between landlord and tenant, the question was whether the daughter of the

tenant had any right of action against the landlord in this case. The Court of Appeal and the House of Lords in *Cavalier v. Pope* decided in similar circumstances that the wife of the tenant had no cause of action on the contract. In that case there was a special contract made between the landlord and the tenant. The circumstances were similar to those in the present case, except that the person injured was the wife instead of the daughter of the tenant. Both the Court of Appeal and the House of Lords held that the wife had no cause of action on the contract. In his opinion there was no difference between the contract made between the parties in that case and the contract made for the parties in the present case by the Act of Parliament."

AT HERTFORD ASSIZES.

June 18th and 19th, 1913.

BEFORE PHILLIMORE, J., AND A SPECIAL JURY.
RUSSELL AND OTHERS v. ROYSTON URBAN
DISTRICT COUNCIL.

Sewer Gas—Injury from Escape of—Negligence
—Nuisance.

This was an action for damages brought by a Mr. James Russell, his wife, two daughters and a maid servant against the Urban District Council for Royston in consequence of illness which they had suffered, and which they alleged was due to the negligent act of the Council in allowing sewer gas to escape from one of their sewers or from a ventilating shaft.

It appeared that the defendants had erected a ventilating shaft to one of their sewers in such a position that the sewer gas went directly into the house in which the plaintiffs lived. The plaintiffs were ill for over a year with sore throats, and diphtheria followed. Some of the plaintiffs had gone to the seaside, whereupon the illness ceased but it returned when they came back to live in the house. Eventually the shaft was removed, when the illness disappeared. The plaintiffs claimed £125 4s. 6d., which was merely the expenses to which they had been put.

The defendants said the sewers were laid according to a system approved by the Local Government Board, and evidence was called to show that the position of the ventilating shaft was the best obtainable for it. They contended that in the absence of negligence they were not liable, and that they had not been negligent. There had been no complaint for two years after the shaft had been erected.

Reports made by the Inspector of Nuisances and by the surveyor were called for by the plaintiffs and admitted as evidence. The officers gave their opinion that the ventilating shaft was not sufficiently tall, but that a higher one would not

entirely remedy the nuisance, and the sewage outfall might be a contributing cause of smells with the wind in certain directions.

PHILLIMORE, J., in summing up, said the defendants maintain that there are no such things as injurious bacteria emanations; but the doctors were agreed that although effluvia from sewage may not carry germs, it may weaken the system and make it receptive to germs and less able to resist them. He left the following questions to the jury, which were answered as follows:—

(1) Were the plaintiffs, or some of them, injured in health by emanations from this ventilating shaft?—Yes.

(2) If so, were these injurious emanations due to the shaft being improperly erected or to the sewer being so kept as to be a nuisance injurious to health, or a combination of the two?—Yes.

(3) Did the defendants act without reasonable care or was it an error of judgment?—Without reasonable care.

Judgment was therefore entered for the plaintiffs for the amount claimed.

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VOL. XXVI.

DEGREES AND DIPLOMAS IN HYGIENE AND PUBLIC HEALTH.

THE possession of a public health degree or diploma is of much value at the present day, and it looks as if this value must increase with the inevitable expansion of preventive medical work. The possession of such a qualification is required (under the Local Government Act, England and Wales, 1888) of a medical officer of health to a population of 50,000 or upwards, save in the case of those who, during any three consecutive years preceding 1892, have acted as medical officers of health to districts with a population of 20,000, or have for three years prior to 1888 been medical officers or inspectors of the Local Government Board. A public health qualification largely determines a candidate's success in obtaining appointments in many other spheres of medical activity. More especially is this so in the School Medical Inspection Service, since the Board of Education has expressed the view that preference should be given in making such appointments to those who hold a degree or diploma in public health. Furthermore, the possession of these qualifications tells in favour of candidates for such appointments as those of a tuberculosis medical officer, and medical superintendent of a fever hospital, and, may be, in Poor Law and lunacy medical appointments.

It is probable that in the future the number of candidates for degrees and diplomas in public health will tend rather to increase than to diminish; indeed, the increase during recent years in the number of provincial centres at which courses of instruction are provided, and these degrees and diplomas are granted, represents for the most part the response to a growing demand. At the present time there are in the United Kingdom as many as seventeen universities and three examining boards granting degrees (such as the M.D. in State Medicine, the Bachelor and Doctor of Science in Hygiene, the Bachelor and Doctor of Hygiene) and diplomas in public health.

The General Medical Council will not consider diplomas to "deserve recognition in the *Medical Register*" unless they have been granted under such conditions of education and examination as to ensure (in the judgment of the Council) the possession of a distinctively high proficiency, scientific and practical, in all the branches of study which concern the public health; and the Council, in forming its judgment on such conditions of education and examination, will expect the following rules to have been observed:—

Rule 1. The curriculum for a diploma in sanitary science, public health, or State medicine shall extend over a period of not less than nine calendar months.

Rule 2. Every candidate for a diploma in sanitary science, public health, or State medicine shall have produced satisfactory evidence that, after obtaining a registrable qualification, which should be registered before admission to examination for the diploma, he has received practical instructions in a laboratory or laboratories, British or foreign, approved by the Licensing Body granting the diploma, in which chemistry, bacteriology, and the pathology of the diseases of animals transmissible to man are taught. The laboratory instruction shall cover a period of not less than four calendar months, and shall include at least 240 hours of practical work, of which not more than one-half shall be devoted to practical chemistry. The laboratory course shall be so arranged as to lay special stress on practical work which bears most directly on the duties of a medical officer of health.

Rule 3. Every candidate shall have produced satisfactory evidence that, after obtaining a registrable qualification, he has during six months been diligently engaged in acquiring a practical knowledge of the duties, routine and special, of public health administration, under the personal supervision of

(a) In England and Wales, the medical officer of health of a county or of a single or combined sanitary district having a population of not less than 50,000, or a medical officer of health devoting his whole time to public health work; or

(b) In Scotland, a medical officer of health of a county or counties, or of one or more districts having a population of not less than 30,000; or

(c) In Ireland, a medical superintendent officer of health of a district or districts having a population of not less than 30,000; or

(d) In the British Dominions outside the United Kingdom, a medical officer of health of a sanitary district having a population of not less than 30,000, who himself holds a registrable diploma in public health; or

(e) A medical officer of health who is also a teacher in the department of public health of a recognized medical school; or

(f) A sanitary staff officer of the Royal Army Medical Corps having charge of an army corps, district, command, or division recognized for this purpose by the General Medical Council.

(g) An assistant medical officer of health of a county or of a single sanitary district having a population of not less than 50,000, provided the medical officer of health of the county or district in question permits the assistant officer to give the necessary instruction and to issue certificates; or

(h) That he has himself held for a period of not less than three years an appointment as medical officer of health of a sanitary district within the British Dominions, and having a population of not less than 15,000.

The certificate for this purpose must, except as provided under (h), include testimony that the candidate has attended under the supervision of the person certifying on not less than sixty working days.

Provided that if the candidate has—

1. Produced satisfactory evidence that he has attended a course or courses of instruction in sanitary law, vital statistics, epidemiology, school hygiene, and other subjects bearing on public health administration, given by a teacher or teachers in the department of public health of a recognized medical school; or—

2. Produced evidence that he has been a resident medical officer in a hospital for infectious diseases containing not less than 100 beds, during a period of three months—

The period during which he has been engaged in acquiring practical knowledge of his duties under this rule may be reduced to three months, to include an attendance on at least thirty working days.

Rule 4. Every candidate shall have produced evidence that, after obtaining a registrable qualification, he has attended during three months at least twice weekly the practice of a hospital for infectious diseases at which candidate has received instruction in the methods of administration.

1. Methods of administration shall include the methods of dealing with patients at their admission and discharge, as well as in the wards, and the medical superintendence of the hospital generally.

2. In the case of a medical officer of the Royal Army Medical Corps a certificate from a principal medical officer under whom he has served, stating that he has during a period of at least three months been diligently engaged in acquiring a practical knowledge of hospital administration in relation to infectious diseases, may be accepted as evidence under Rule 4.

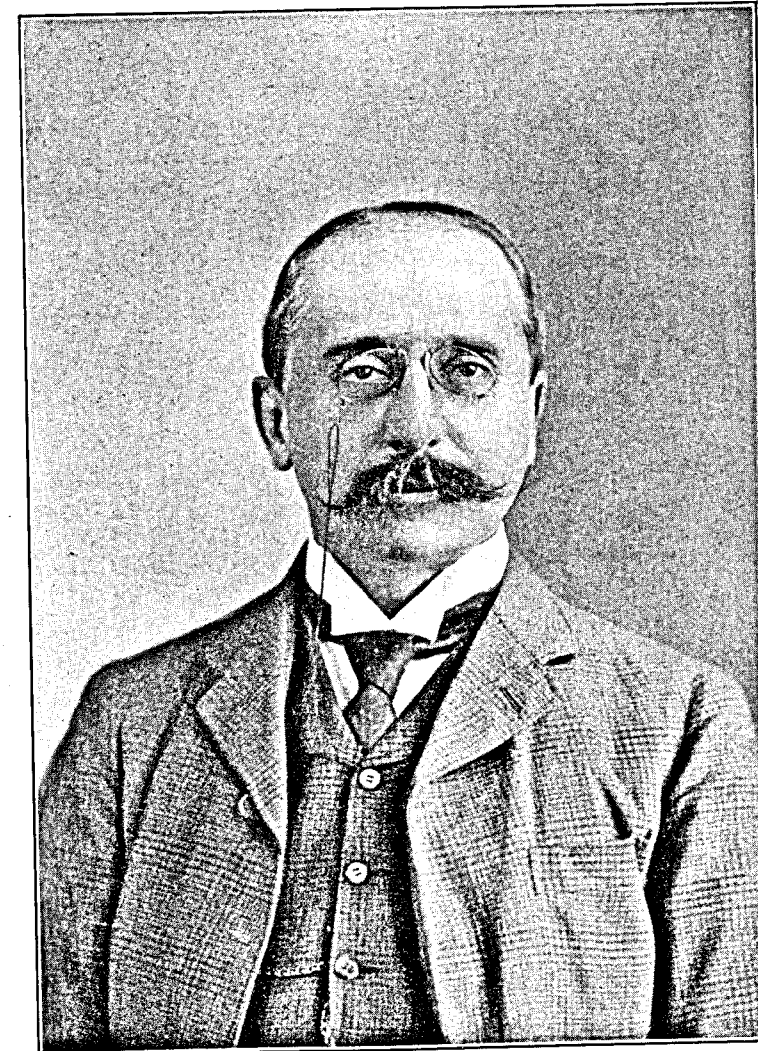
Rule 5. The examination shall have been conducted by examiners specially qualified; it shall have extended over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical

examination in, and reporting on, subjects which fall within the duties of a medical officer of health, including those of a school medical officer.

The regulations as they now stand satisfactorily fulfil their purpose. The regulation requiring that the Diploma in Public Health candidate shall gain a first-hand experience of the duties, routine and special, of a medical officer of health, is of great importance, as this knowledge bears most directly upon the future work of the majority of those who obtain the diploma. This need of the public health student is being far better met now than formerly, when candidates, often in batches, were most generally addressed in the offices or homes of the medical officers of health. It is intended by the regulation, and it is essential to the candidates, that they should be taken individually (or at most the number should not exceed two or three) and allowed to make themselves practically familiar with the current work in and outside the office of the medical officer of health. It is a wise regulation which now gives to the candidate the option of substituting half of the six months' period formerly required to be spent with the medical officer of health by a course of lectures upon sanitary law and administration, delivered at some recognised institution; for after being for three months "diligently engaged" in acquiring experience of the work of a medical officer of health, as a general rule the student can more profitably employ himself during a second three months in attending lectures by an experienced teacher, who can deal with such public health legal and administrative work which lies beyond the ability of any one medical officer of health, to actually illustrate in his own practice and experience.

While many students for the Diploma in Public Health engage in part-time medical work while meeting the above regulations, an increasing proportion of candidates find it necessary to devote their full time to preparation for the examination if they propose to present themselves at the end of the nine months' period. Therefore the cost of obtaining the Diploma in Public Health varies according to circumstances; but it may be stated that, while special terms are made at most universities for their own graduates, the fees demanded for the necessary instruction are generally in the neighbourhood of twenty-five guineas, and the examination fees amount to an additional ten to twelve guineas.

The development of the curriculum for



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Medical Officer of Health of the City and Port of Liverpool.
President of the Society of Medical Officers of Health, Session 1912-1913.

* The Rules 2, 3, 4, as to study, shall not apply to practitioners registered, or entitled to be registered, before January 1st, 1890.

the Diploma in Public Health has, of course, kept pace with the evolutionary phases of our public health practice. For the first few years in which such diplomas were granted, bacteriology was not an examination subject; the details of practical sanitation and sanitary engineering, more particularly of dwellings, dominated the examination; and a practical chemical examination of limited scope became stereotyped in character for many years. But with the widening of the scope of study the examination broadened out and improved. The curriculum soon began to embrace the subject of bacteriology, which has now very properly grown to assume a position of preponderating importance. Practical (constructional) sanitation now takes a place more rightly in accord with its relative importance, and the subject of school hygiene is growing to receive the recognition which is its due. It is possible to foresee further developments (in connection with vital statistics, eugenics, etc.) which must have the effect of making an increased demand upon the student; and teachers find that it is becoming more and more difficult to adequately prepare candidates for diplomas in public health in face of the ever-growing demands of the subject. Most candidates will present themselves for examination immediately the requirements of the regulations are met; and as the success of teaching institutions is so largely determined by the success of their students at examinations, many teachers are realising that if they are to obtain the high results which they are prepared to work for, either the regulation period of nine months' study must be increased to a compulsory twelve months, or room must be made to meet the growing demands of certain branches of study by restricting the scope of others which in the evolutionary process are shrinking in importance. It would be difficult, even if space permitted, to define the present-day relative values of all the subject-matters which are embraced in the hydra-headed subject of hygiene, and estimates would necessarily differ on this subject; but it may be asserted with some confidence that the scope of the teaching in practical chemistry could be reduced without loss, and that the difficulty complained of may be dealt with on such lines rather than by adding to the requirements, already onerous, of the term of study.

Why, for instance, continue to teach candidates for degrees and diplomas in public

health much of the work in food analysis which, for reasons it is difficult to justify, have grown into the recognised course of chemical laboratory instruction? What, for instance, is the precise value to the medical officer of health of the knowledge of how to conduct an examination of butter and coffee in order to detect the presence of margarine and chicory?

If the effect of the omission of such irrelevant matter would enable the examiners to demand an expert knowledge (but rarely found) in the analysis of water and the correct interpretation of the results, would it not be justified? The medical officer of health may be called upon to perform certain analyses (of water, sewage effluents, air of school class-rooms, disinfectants, etc.); but for the chemical analysis of food another official, the Public Analyst, is appointed. So the medical officer of health has no official duties in connection with the chemical examination of food any more than of drugs. If he is given the information which will enable him to advise his committee as to prosecutions under the Sale of Foods and Drugs Acts, and in some cases to fit him to give evidence in support of such prosecutions, he can certainly be spared the learning of a great deal of that which is at present being taught on food analysis. The case is different in regard to bacteriology. He *may* have to obtain all the necessary information under this head in his capacity as the medical officer of health. It may be contended that some of those who sit for our British public health degrees and diplomas leave Great Britain to practise in foreign climes where their official duties may include a scrutiny over the genuineness (in addition to wholesomeness) of food, and so they may have to act in the capacity of public analysts. The answer is that such exceptional public health officials should be made to furnish evidence, additional to their public health qualification, of a further qualification for these duties, rather than the interests of the mass of our students should suffer—for it is recognised by the Local Government Board, and even by Local Authorities, that our public health qualifications are no sufficient guarantee of a competency to discharge such extra duties. How far is the Diploma in Public Health student to be asked to travel into the domain of the biological work in connection with tropical diseases foreign to our Islands? Thanks to much excellent research work, the subject of tropical hygiene has bounded into great prominence;

but because the Diploma in Public Health man may travel abroad for practise is he to be required to have an expert knowledge of the widest range of tropical hygiene? Certainly not; while the narrow range of knowledge expected certainly lacks definition, it is realised that tropical hygiene is only exceptionally embraced in the life-work of candidates who take our public health degrees and diplomas, and that these exceptional candidates must be made to obtain an extra qualification—a diploma in tropical medicine. Surely the exceptional Diploma in Public Health candidate who may have to qualify himself for the duties of a food analyst should be dealt with on similar lines.

The view has often been expressed that those candidates for public health qualification who are certainly going to practise in India and other tropical countries should not be required to obtain a knowledge of the public health legislation in force in Great Britain; but there is this to be said against any such exemption, British public health legislation and administration, as compared with that in most of our possessions, represents the high-water mark in these matters, and a knowledge of it cannot fail to be of great practical value (directly and indirectly) to any student of and administrative worker in public health, wherever he may be.

It would be an advantage if the laboratory work which should properly fall within the sphere of the public health student who is qualifying himself for official work in this country could be clearly and closely defined; it would then be possible to concentrate upon, and to demand a higher standard of knowledge of, the really important work. Then would disappear the anomaly, to be so generally witnessed, of many candidates failing to interpret aright the results of a chemical analysis of water, while showing a satisfactory knowledge of methods for distinguishing between butter and margarine, coffee and chicory, etc. The General Medical Council has no powers to limit the scope of the work undertaken at the teaching centres, or, for that matter, the scope of the examination. This step, if approved, can only be taken by the different teaching and examining bodies agreeing among themselves as to the scope of the work which shall be required of future candidates. More especially is this clear definition necessary to those who have to provide for the teaching and training in laboratory work at institutions which are only

teaching centres, as their students are sent to obtain their qualifications elsewhere at various examination centres at which considerable differences are to be noted in the nature and scope of the laboratory work demanded. It is obvious that a centre which provides not only the teaching and the training, but also the qualifying examination escapes from this difficulty and enjoys an advantage in this respect.

The increase above referred to in the number of Provincial Centres for post-graduate teaching and training in hygiene and public health is a welcome development, which must lead to a more general special study of this subject; but the existence of a large number of centres in one city, such as in London, can hardly be justified on these grounds and it is not conducive to the best results.

The Board of Studies in hygiene and public health of the University of London has recently arrived at the decision that it would lead to a considerable improvement upon the existing conditions in London, if there could be provided one well-equipped University Centre at which the teaching and training in the subject of hygiene and public health could become centralised, and in connection with which ample facilities could be provided for organised research work. On the average, some 150 post-graduate students prepare themselves each year for public health degrees and diplomas in London, and hitherto the necessary teaching work has been well done; but under difficult circumstances. In illustration of these difficulties it may be pointed out that 140 candidates for the Diploma in Public Health work at ten different centres and demand part-time services of 44 lecturers and demonstrators; and that if three centres, with 15 of staff, at which 95 students are prepared, are excluded, it will be seen that at the other seven centres the students only average three or four at any one time of the year. Therefore the existing arrangements call for a large provision of teachers, many of whom can afford to devote but a small part of their time to the few candidates who come to them for this post-graduate teaching. The paucity of research students in London in this important subject is regrettable; and it is to be attributed mainly to the scant endowment of this work. The student who has (as a rule) but recently obtained his medical qualifications, and who has in addition devoted from nine months to a year to the work necessary to obtain a diploma

in public health, cannot often afford to devote further money and time to research; and there are good grounds for believing that many would usefully so employ themselves if a competency could be offered them in the meantime. The suggested centre would be a part of the University of London, under definite university management, and a special appeal would be necessary to raise the £30,000 which the Board estimates to be the cost of a suitably equipped building (exclusive of site). The Board also estimates that, after allowing for an income of £2,000 from students' fees, etc., a balance of about £6,000 would have to be provided to meet expenses. Without some such provision the post-graduate work in hygiene must fall far short of what it is possible for it to become. The opportunities for this work in London are unequalled elsewhere, for in the vast city and its environs there exist unique advantages for demonstrating the great variety of provision which may be made in the interests of the public health. It is desirable for this and other reasons that London should attract more post-graduate students of public health. Although, for the capital of the British Empire, the endowment of public health research work is of a very meagre character, the research student who is able and willing to work without any endowment has abundant opportunities and a wealth of material to work upon in London.

As an essential part of medicine, preventive medicine and hygiene should receive more recognition in medical teaching and training. A sound knowledge of personal and domestic hygiene is certainly essential to the practitioner of medicine; and with increasing appreciation on the part of the State and the public of the principle that the prevention of disease is better than cure, its importance may be expected to become more generally recognised. All candidates for a medical degree or diploma should not only be required to attend a course of instruction in such subject-matter, but *due importance should be attached to it in all qualifying examinations*. Examiners find, however, that the working knowledge of matters of hygiene which many candidates for M.B. degrees possess continues to be very imperfect and unsatisfactory. Although it is generally an examination subject, it is so seldom a factor in determining the candidate's success or otherwise in obtaining his qualifying degrees, that complaints are general—from teachers that undergraduate students will not give proper

attention to lectures on hygiene and public health, and from examiners that despite unsatisfactory results in hygiene the candidates are generally granted the degree if they satisfy in the other subjects. The time has come to change all this. By "referring" students who fail to reach the low-limit of marks necessary for a pass in hygiene, irrespective of results in other subjects, the students will soon grow to regard hygiene as a serious and important branch of study.

THE LATE DR. HERBERT MANLEY.

OUR June number contained an obituary notice of the late Dr. Herbert Manley, whose death has removed from among us an especially able and zealous worker in public health. It is with much regret we learn that his widow has been left in circumstances which make it desirable that a fund should be raised for her assistance. We commend this proposal to all Fellows and Members of the Society able and willing to contribute.

The following Fellows have already signified their desire to subscribe:—

The President, Dr. E. W. Hope	£5	0	0
Dr. George Reid	5	0	0
Dr. Bostock Hill	5	0	0

The following subscriptions have also been received:—

Dr. F. J. Allan	...	£1	1	0
Dr. T. Ridley Bailey	...	1	1	0
Dr. J. H. Garrett	...	1	1	0
Dr. J. R. Kaye	...	1	1	0
Sir Shirley Murphy	...	1	1	0
Dr. A. Newsholme, C.B.	...	5	0	0
Dr. L. C. Parkes	...	2	2	0
Dr. F. E. Rock	...	1	1	0

The Hon. Treasurer of the Society will be happy to receive any further contributions, which should be addressed to 1, Upper Montague Street, Russell Square, London, W.C.

TRACHOMA.*—DR. ISRAEL gives an interesting account of his personal experience of a severe attack of trachoma, the result of infection during operation on a trachomatous patient. After an interval of eight days the mucous membrane of the lid became swollen and hyperæmia and follicles appeared. The condition developed into a severe attack of trachoma, in spite of all precautions taken even at the moment of infection. As a result of this and a previous wide experience of the disease, Israel advocates the necessity for excision of the infected mucous membrane to produce satisfactory results in acute cases, and he rejects the view that such procedure is likely to be followed by deformity.

* Zeitschrift für Medizinalbeamte. No. 6. March 20, 1913.

HYGIENE AND PREVENTIVE MEDICINE AT THE 17TH INTERNATIONAL CONGRESS OF MEDICINE, LONDON.

THE meetings of the Hygiene and Preventive Medicine Section of the International Congress of Medicine were held in the Lecture Theatre of the Victoria and Albert Museum, South Kensington. The Section had as its President Dr. Arthur Newsholme, C.B.; the Secretaries were Drs. A. S. Arkle, J. C. G. Ledingham, G. F. McCleary, and W. G. Willoughby.

Thursday morning, August 7th.

Subject for discussion:—

THE EFFECTS OF DUST IN PRODUCING DISEASES OF THE LUNGS.

The reporters were Dr. E. L. Collis (Home Office, London) and Professor F. Heim (Paris).

Dr. COLLIS classified dusts into three groups:—(a) animal dusts, such as horn, silk, wool, etc., not producing pneumokoniosis and without harmful effect on man; (b) vegetable dusts, such as jute, flax, cotton, flour, etc., producing respiratory disease in proportion to the amount of husk in the dust, the symptoms being mainly of asthmatic type; (c) mineral dusts, such as iron, steel, clay, coal, quartz, etc., rendering the worker liable to other forms of respiratory disease, such as bronchitis, pneumonia, and pulmonary tuberculosis, the actual type of disease depending on the dust. Thus glass-workers are subject to bronchitis, workers in slate to pneumonia, while those engaged in trades where dust rich in silica is produced are specially liable to pulmonary tuberculosis.

The main part of Dr. Collis's paper was devoted to a careful analysis of various trades to substantiate his statement that the frequency of pulmonary tuberculosis is governed largely by the proportion of free crystalline silica in the dust. Thus pulmonary tuberculosis is rife among workers in hard stone, but not among those working in limestone. In Dundee, where sandstone is worked on a large scale, the proportion of pulmonary tuberculosis is lower than that commonly found among sandstone-workers. With this is associated the fact that Dundee's old red sandstone contains less quartz (free silica) than ordinary sandstone.

The fibrosis of the lungs following long-continued inhalation of dust affords very few clinical signs, and is marked mainly by diminished chest expansion and by a rise in blood-pressure due to the pulmonary fibrosis.

Dr. Collis finally made the suggestion that "in general dusts appear to be more injurious as their chemical composition differs from that of the human body, or from the elements of which the body is normally composed."

PROFESSOR HEIM was unable to be present at the meeting, and an abstract of his paper was given. Heim insisted that a classification of dust-diseases should be based on medical standards and not on the nature of the occupation. He classified dusts as "active" and "passive," the former being subdivided into poisonous, irritating, or infectious dusts.

In PROFESSOR CAROZZI'S absence a short abstract of his paper was given. Carozzi pointed out that industrial dust can reach the deepest part of the respiratory apparatus, especially where defects, such as narrow nasal passages, deflected septa, etc., are present. Alcohol lowers the activity of the ciliated epithelium of the bronchi, and is hence an important factor in determining the incidence of disease in dusty occupations.

DISCUSSION.

DR. MURRAY LESLIE dealt mainly with silicosis. He agreed with Dr. Collis that it had a special symptom-complex, later age onset, and less infectivity, when tuberculous, than had ordinary pulmonary tuberculosis. This he attributed to the dryness of the disease. Very few crepitations are found, and hence but little softening can be present. The patient has very little expectoration. Dr. Leslie was inclined to think that tuberculosis supervenes in silicosis at an earlier date than is usually appreciated. Pneumokoniosis begins at the root of the lungs, and radiography is of very great service in its early diagnosis.

DR. ANGUS MACDONALD (Jamaica), referring to his past experience in Staffordshire, had not noticed a smaller infectivity in potters' rot as compared with ordinary pulmonary tuberculosis. As regards the limestone dust, very prevalent in Kingston, it was soft in nature, and catarrhal disease was rare in Kingston, while pulmonary tuberculosis had the mean average of a tropical city.

DR. BARWISE (Derbyshire) noted the co-incidence of excessive industrial tuberculosis in Derbyshire with the gritstone districts, and showed also that in Derbyshire coalminers suffered less from pulmonary tuberculosis than did agricultural labourers.

SIR ARTHUR WHITELEGGE (Home Office) pointed out that while in continental industries great efforts were made to suppress dust as dust, even where not known to be injurious, in this country efforts were concentrated on checking the production of dust known to be dangerous.

DR. COLLIS, in closing the discussion, emphasized the fact that silicosis is a definite entity with symptoms not in any way due to the presence of tuberculosis. The worker, apart from dyspnoea, is physically well and strong, and has no fever. He remains in this condition for years, till suddenly at the onset of tuberculosis the whole aspect of the case changes and the patient shows the cardinal signs of that disease.

At the close of the discussion Dr. Collis gave a demonstration of photographs and of specimens in the museum bearing on his paper.

Thursday afternoon, August 7th.

The following papers were read:—

DR. DESIDERIUS HAHN (Budapest) discussed *lead-poisoning amongst printers and its prophylaxis*. He alluded to the fact that the poisoning was due to the dust from the lead type, and occurred either through inhalation or through injection. He urged that in addition to improving the cleanliness and lighting of workplaces and controlling the hours of work, public authorities should undertake examinations of the blood and estimations of the blood pressure in suspected cases of lead-poisoning.

DR. K. HEBERDEN BEALL (Texas):—*The Invasion of America by Pellagra*. Dr. Beall showed that pellagra is now found in 48 States, and is very prevalent in 12 of these. The region of the Rocky Mountains is for the most part free from pellagra. Invasion by the disease has probably been from east to west, and there are computed to be now at least 30,000 pellagrins in the United States. While in Europe pellagra is mainly a rural disease, in the United States one-third of the cases occur in cities.

So far as Texas is concerned, Dr. Beall is of opinion that there is no possibility of the disease being conveyed by *Simulida*. The country is arid and contains very few running streams. No *Simulida* were found in a special investigation in a region where pellagra was specially abundant.

In Europe the incidence is approximately the same in the two sexes. In the United States there is a very great preponderance among women, suggesting that the disease is in some way associated with conditions in or around the house. In support of this idea it is noted that where both sexes spend their time largely away from home, as in the case of mill-hands, the incidence is equal in the two sexes. Negroes show a comparative immunity to the disease.

DR. BERNHARD VAS (Budapest) on "*The Disinfecting Power of the Commoner Disinfectants*." Dr. Vas conducted a series of experiments with

carbolic acid, formalin, and corrosive sublimate, neutralising the disinfectants after they had acted for varying times on selected organisms, and plating on to agar. He concludes that the disinfecting power of these substances is considerably less than is commonly supposed.

DR. GEORGES ZIPFEL (Dijon) on "*The Disinfecting Station, Dijon*." Dr. Zipfel gave a short description of the model disinfecting station established in Dijon, and referred enthusiastically to the improvement in the general health of the city since the installation of this station.

Friday morning, August 8th.

Subject for discussion:—

INFANT MORTALITY IN THE FIRST FOUR WEEKS OF LIFE.

The Section met jointly with the Sections of Obstetrics and Gynaecology and of Diseases of Children. The reporters were Dr. A. K. Chalmers (Glasgow), Dr. Henry Koplik (New York), and Professor Wallich (Paris).

DR. CHALMERS considered the question as to whether the deaths of infants from prematurity were due to disease or to defective metabolism in the mother. Dealing with the statistics for Scotland, he showed that the death-rate from immaturity has risen steadily since the period 1881-5, but indicated that this was probably accounted for by more strict notification of children who have lived only for a few minutes or hours, who would previously have been regarded as still-births. Dr. Chalmers' paper contained interesting data respecting the frequency of previous still-births or miscarriages in cases of still-birth, the age-distribution of the mothers of still-born children, and the relation of still-births to the employment of mothers.

DR. KOPLIK discussed the bearing of breast-feeding, of social position, and of legitimacy or illegitimacy on the infant mortality in the first month of life. He emphasized the need for more maternal and medical care in the first weeks of life, and considered that a large part of the mortality from respiratory diseases in the new-born was preventable. Dr. Koplik alluded to the movement beginning in America for the establishment of retreats for pregnant women.

PROF. WALLICH showed that in France, as in this country, the death-rate within the first four weeks of life forms a high proportion of the total death-rate. The bulk of this mortality in the first month is due to immaturity, only a small proportion being due to obstetrical reasons. Dealing with the social factors

involved, Professor Wallich showed that direct maternal care was of more direct bearing than legitimacy on the well-being of the infant. The death-rate of illegitimate infants nursed by their mothers was at all ages under one year less than that of legitimate children separated from their mothers. Prof. Wallich urged, first, improvement in obstetric practice, and second, assistance to the pregnant woman and to the mother during the first month of the infant's life.

DISCUSSION.

DR. JOHANN VEIT (Halle) laid especial stress on the importance of syphilis in determining premature birth and death, and on the frequency of syphilis as shown by the results of the Wassermann reaction. He urged routine examination of the blood in the early stages of pregnancy, and treatment, where the result is positive, till the latter becomes negative.

SIR FRANCIS CHAMPNEYS (London) urged the need for inculcation of the importance of breast-feeding, and hoped for the time when it would be fashionable for mothers to nurse their infants.

DR. ARMAND ROUTH (London) advocated systematic examination at an early stage of pregnancy, so that syphilis, contracted pelvis, albuminuria, etc., might be detected at an early stage and the necessary measures taken to preserve the life of the embryo.

SIR JOHN BYERS (Belfast) referred to the fact that the very poverty of Ireland probably had some influence in producing its low infant mortality, since the mothers are too poor to provide artificial food for their infants. Some form of reporting of pregnant women would be useful, so that the ante-natal conditions might be investigated.

DR. ERNST DEUTSCH (Budapest) alluded to the important part played by alcohol in producing a high infant mortality in Slav and Polish populations.

DR. ALICE VAN-INGEN WINTER urged the need for notification of all cases of pregnancy by the fourth month of pregnancy, and for the withdrawal of all married women of child-bearing age from the labour market.

The following also spoke: Drs. Mary Scharlieb, Irons, Eric Pritchard, Eden, Nagel (Berlin), Murdoch Cameron, Munro-Kerr, and others.

Friday afternoon, August 8th.

The following papers were read:—

DR. R. DUDFIELD on "The Registration of Still-births." Dr. Dudfield dealt with the varying practice in different countries as regards the registration of still-births, and urged the need of a system of registration in this country, as a weapon to attack the problem of the causes of prematurity. He discussed the definition of a still-birth in law, and pointed out the need for

an international definition if statistics of different countries were to be made comparable.

DR. ANGUS MACDONALD (Kingston, Jamaica) on "Preventive Control of Tuberculosis in the Tropics." After referring to the scanty figures available for the study of tuberculosis in the tropics, Dr. Macdonald referred to the social condition of the people predisposing them to infection—the crowding, the lack of ventilation, and the fatalism of the poorer classes. He urged the necessity for compulsory notification of pulmonary tuberculosis throughout the tropics as is the case in Jamaica, and outlined a scheme of hospital treatment and after-care as adopted at Kingston, Jamaica.

Papers were also read by PROFESSOR MONTEFUSCO on the diffusion of croup at Naples and by DR. DEUTSCH (Budapest) on the social supervision of abnormal children.

Saturday morning, August 9th.

Subject for discussion:—

THE FACTORS THAT DETERMINE THE RISE, SPREAD, AND DEGREE OF SEVERITY OF EPIDEMIC DISEASES.

Dr. Major Greenwood (London) and Prof. G. Sticker (Bonn) were the reporters.

DR. GREENWOOD drew attention to the variations in virulence occurring during the course of history in various diseases, and traced these variations in detail in the case of scarlet fever. Dr. Greenwood referred to three factors as conceivably producing the decline in certain infectious diseases, (a) better treatment and prophylaxis, (b) a weeding out of susceptible stocks, (c) variations in pathogenicity of the infecting organism. As regards the first suggestion, similar remissions have occurred in the past in the absence of modern methods of prevention and of curative medicine; secondly, the weeding out of susceptible stocks would appear to be an inadequate explanation.

Dr. Greenwood believed that ultimately laws may be propounded which will accurately measure the course of epidemics, though at present no adequate law can be stated. He believed it likely that in epidemics variations occur in the infecting organism, so that the latter's infectivity is a function of the time. Finally, he laid stress on the importance of carefully considering the previous history of disease, both from a national and from an international standpoint.

PROFESSOR STICKER (Bonn), after reviewing the history of epidemiology, discussed the relation of epidemics to the infecting organism. He expressed himself as somewhat sceptical as

to the part played by the cholera vibrio in such epidemics as the Hamburg outbreak, and favours Pettenkofer's view that epidemics are influenced largely by factors inherent in the soil and in the season.

DR. BROWNLEE, in a supplementary report, concluded that pathogenic organisms pass through cycles of varying virulence, and that the phenomena of epidemics are due to the organism becoming suddenly infective and thereafter losing its infectivity at a rate approximating to a geometrical progression. He illustrated this by a numerical example. Dr. Brownlee adduces evidence, based on cross-infection in wards, which he believes to indicate loss of infectivity in organisms.

DISCUSSION.

DR. HAMER (London) suggested that in certain instances, as, for example, in the few cases of cerebro-spinal fever and of human glanders notified in recent years in London, the apparently infecting organism might rather be the jackal than the lion.

DR. J. JAMIESON (Melbourne), though expressing himself as not pessimistic as to the future of epidemiology, felt that at present we were only groping in the dark.

DR. GOODALL deprecated the view that epidemics worked themselves out with a mathematical regularity unaffected by human effort. He believed in the value of preventive measures in controlling epidemics. Referring to variations in virulence, Dr. Goodall noted that an apparent diminution of virulence had occurred even within a period of eight years in cases of scarlet fever admitted into the Eastern Hospital of the Metropolitan Asylums Board.

DR. LEDINGHAM spoke in refutation of Professor Sticker's views, giving data bearing on the relation of bacteria to epidemics.

DR. BOND referred to increasing urbanisation as a factor producing apparent diminution of virulence, through the increasing frequency with which the people in general pass through slight unrecognised attacks.

DRS. GREENWOOD and STICKER then replied.

Monday, August 11th.

Subject for discussion:—

THE SUPERVISION OF THE HEALTH OF CHILDREN BETWEEN INFANCY AND SCHOOL AGE.

The Section met jointly with the Section of Stomatology. The reporters were Dr. W. Leslie Mackenzie (Edinburgh), Dr. Robert Dinet (Paris), and Mr. W. W. James (London).

DR. LESLIE MACKENZIE pointed out that while intensive study of the first year of life had

gone forward rapidly, and while from five years of age onwards the child was under the supervision of school medical officers, the period from one to five years was still more or less unprovided for. The real problem was how, in his earliest years, to prepare the child for undergoing at five the strain of education.

Discussing the minimum age for school, Dr. Mackenzie referred to Mr. Winch's psychological researches, from which the latter concluded that entry from three to five confers no intellectual advantage on the child; and that there is some evidence that entry after five causes some retardation in subsequent school progress. Dr. Mackenzie concluded that the ordinary school is not the place for children aged three to five. Referring to the nursery school, he pointed out its necessity for the preservation of the family where overcrowding in one and two-roomed houses is rife. He does not lay much stress on the dangers of school-life in influencing outbreaks of infectious disease among children aged four to six. Dr. Mackenzie advocates correlation on administrative lines between medical inspection in school and the work done by the Public Health Department in the home in supervising the sequels of infectious disease, such as measles and whooping cough. In reviewing the possible agencies which could be utilised to fill the gap from one to five, Dr. Mackenzie referred to the wider use of health-visitors, of voluntary associations, and of school clinics.

MR. JAMES, discussing the question from its dental aspect, reviewed the present knowledge concerning the dental development of the child and the factors favouring dental caries. He referred to the need for supervision of the food, of cleansing of the teeth, and for early dental treatment on conservative lines.

The subsequent discussion was carried on by Drs. Keith Shaw, Forsyth, Kerr, Arkle, Sim Wallace, Cruet, Woods Hutchinson, and others.

Monday afternoon, August 11th.

The following papers were read:—

DR. J. MACWALTER (Dublin) on "The Necessity for State-endowed Hospitals and a State Medical Service." Dr. MacWalter referred to the voluntary hospital system as dead. In view of the State action involved in national insurance, he believed that the present system of voluntary hospitals and of private medical men not under the control of the State must come to an end.

DR. A. L. SORESI (New York) on "Preventive Medicine Attainable only by Compulsory General

Medical Education." Dr. Soresi advocates "a general compulsory medical education, based on a good practical knowledge of anatomy, physiology, pathology, and hygiene, beginning with the elementary training of children, together with a general diffusion of such knowledge through all grades of society." He refers to the innumerable possibilities of infection which, in the absence of such knowledge, he believes must defy all the efforts of preventive medicine.

Tuesday, August 12th.

The morning session was devoted to the discussion of the causes, prevention, and treatment of visual defects in school children.

The work of the Hygiene and Preventive Medicine Section of the Congress was closed with fitting dignity by an impressive general address to the Congress by the RT. HON. JOHN BURNS, M.P., on "*The Relationship between Medicine and Public Health.*"

After giving an international roll of honour of the more famous medical men of the nineteenth century, Mr. Burns gave statistics showing the enormous saving of life which has occurred of late years through the activity of medical science. He showed how the motives of philanthropy, of panic, and of economic necessity had in the past combined to secure, step by step, sanitary reform.

Referring to the stages in registration of disease in this country, Mr. Burns showed how as it became evident that registration of deaths alone gave a very imperfect view of the prevalence of disease, notification, first in some cases voluntary and then compulsory, first local and then national, was instituted of the commoner infectious diseases, of poliomyelitis and cerebro-spinal fever, and of tuberculosis. Mr. Burns stated his intention of issuing shortly an Order making notification of ophthalmia of the newly-born compulsory throughout this country. In reference to tuberculosis, Mr. Burns noted that instances of hardships to patients as a result of notification have been very few, and referred to the preventive work, largely unconscious, which has been carried out in the past in public institutions through the segregation of the more advanced cases of pulmonary tuberculosis.

Mr. Burns paid a tribute to the work of Pasteur, Lister, Semmelweis, and Koch, to the influence of nursing in preventive medicine, and to the work of female sanitary inspectors, health visitors, tuberculosis nurses, and school nurses.

After referring to the possibilities afforded by national insurance of the more exact appli-

cation of science to problems of public health, Mr. Burns closed his speech by a happy reference to national inter-dependence in matters of health.

Among the many points of interest in Mr. Burns' address the following may, in particular, be noted: the forthcoming issue of regulations giving sanitary authorities additional control over shell-fish; the hope expressed by Mr. Burns that the Notification of Births Act will ere long be adopted in every sanitary area; the promise that the notification of *ophthalmia neonatorum* would shortly be made compulsory throughout the country; and a reference to the splendid work now being done in the clinical laboratories of many large general hospitals. Mr. Burns expressed the hope "that in the near future it may be practicable to extend the work done in laboratories, and to make it available for the wider needs of general practitioners, thus enabling them to bring up their work more nearly to the level of that carried on in well-equipped hospitals."

RADNORSHIRE COUNTY COUNCIL.—In his annual report for 1911, Dr. Pole gives a digest of the reports of the medical officers of health of the eight urban and rural districts of the county. Despite the exceptional warmth of the year and the marked drought, which considerably interfered with the water supply, only four deaths were certified to be due to diarrhoea, two only being amongst children under the age of twelve months. The infantile mortality rate was 62 per thousand births; the lowest since 1906. The Notification of Births Act is not in force in any part of the county and Dr. Pole is of opinion that it would be of little use unless health visitors were appointed. The cost of maintaining such visitors would be prohibitive and he suggests that lay visitors, giving their services voluntarily, would be exceedingly useful. Considerable fault is found with the isolation hospital provision and in one district (Knighton Rural) it is pointed out that the hospital provided is very inaccessible and no disinfecting apparatus is provided, "with the result that whenever a patient leaves the hospital his or her clothing has to be destroyed and replaced at great expense." The housing question has received considerable attention from the medical officers and inspectors and there seems to be no dearth of cottages. In connection with house-to-house inspection, in one district it was found that as a result of giving notice of intention to inspect, a general cleaning up ensued, and it was impossible to form a true idea of the conditions. The practice of giving notice is to be discontinued; notice only being sent in those cases in which an "offer" to inspect is refused.

THE CAUSES OF DECLINING INCIDENCE OF TYPHOID FEVER.*

By C. O. STALLYBRASS, M.D., B.S., D.P.H.,
Assistant Medical Officer of Health, Port of Liverpool.

ONE of the most noteworthy occurrences within the realm of preventive medicine is the great decline of typhoid fever that has occurred within the last twenty or thirty years. This decline has not been confined to the British Isles, but has happened in almost all civilised countries—Northern Europe especially. A reference to the diagram before you will show that some of the most striking results have been achieved abroad. The Hague vies with Edinburgh in the lowness of its enteric death-rate, now approaching nil—a point already reached by many smaller towns. The rate in these two towns is 1 death per 100,000 population. In many places, of which Paris, Chicago, and Rio de Janeiro are representatives, the death-rate has been enormously reduced in the last thirty years, although not yet to the level of Berlin and Vienna. Sweden, Prussia, the Netherlands, and Switzerland have death-rates below the British figure.

This decline, although so general, is not by any means universal. Thus St. Petersburg, where the death-rate fell from 129 to below 50 in the first 15 years, exhibited a considerable rise during the second 15 years: this is, undoubtedly, to be attributed to pollution of the water supply which culminated in a water-borne epidemic of cholera in the years 1908, 1909, and 1910. This exercised a chastening influence and effected an improvement in the water supply, an improvement reflected by a considerable drop in the enteric fever death-rate in 1911. Montreal is another example—unfortunately, typical of a not inconsiderable number of American cities—the polluted general water supply leading to a formidable outbreak in 1910. This announced itself on this side of the Atlantic by an increase in the number of cases occurring on vessels from Montreal in that year. The numbers of deaths in the United States and Canada show a tendency to increase—possibly to be accounted for by a more complete registration of deaths.

Turning to cities in the British Isles we find that, though very considerable reductions have been effected, the progress has not been entirely uniform. As the Registrar-General has pointed out, the statistics for England and Wales may be divided into two periods of decline, separated

* Read at the Provincial Meeting of the Society of Medical Officers of Health at Liverpool, on May 24th, 1913.

by a period lasting from 1890 to 1900, when the rates were stationary. A similar period of slackened reduction and even increase is to be observed in Scotland and Ireland.

There is an actual rise in the rates of Birmingham and Glasgow, and a small rise in those of London and Edinburgh.

To what are these rises due? In the case of the very large rise in the enteric death-rate of Belfast, we have the high authority of Dr. Darra Mair for stating that it was due to the consumption of contaminated shell-fish. Can this be the explanation of the rise in the rate of those four towns and the cessation of the decline in England and Wales generally? It is not easy to suppose that there was an increase in the contamination of shell-fish throughout the country sufficient to counter-balance the total results of improved sanitation and increased isolation of the sick, etc.; or was the increase only apparent, and due to the greater accuracy of diagnosis, resulting in a transference of deaths from some other heading to that of enteric fever? This is rendered not improbable when one considers that the Infectious Diseases Notification Act of 1889 immediately preceded the rise in several of the towns. But, if due to this cause, why should the rise be mainly in deaths of males? It cannot be due to the inclusion of deaths previously certified as from simple continued fever. These had almost vanished before the period of slackened fall, and had previously been falling *pari passu* with the deaths from enteric. It cannot be due to any considerable extent to the alterations in the case mortality, if the Metropolitan Asylums Board's statistics are a guide. Climatic influences were apparently at work in some years, notably 1893, when the summer was much hotter than the average. But, if so, why was Manchester exempt from an influence affecting Liverpool? It is certainly noteworthy that the infantile mortality rates in these isles have exhibited fluctuations closely resembling those shown by enteric, and therefore very possibly due to the same causes. It would be of the greatest value if light could be thrown on the causes of this retardation of the decline during the decade 1890 to 1900.

In the case of Liverpool, the rise set in some years earlier than in the country generally. It culminated in the hot year 1894, following the exceptionally hot year 1893; the deaths in these two years numbering 211 and 248. Now, I suppose that one of the principal factors in the reduction of typhoid in late years

CHART I.

Enteric Fever—Death-rates per 100,000 Population.

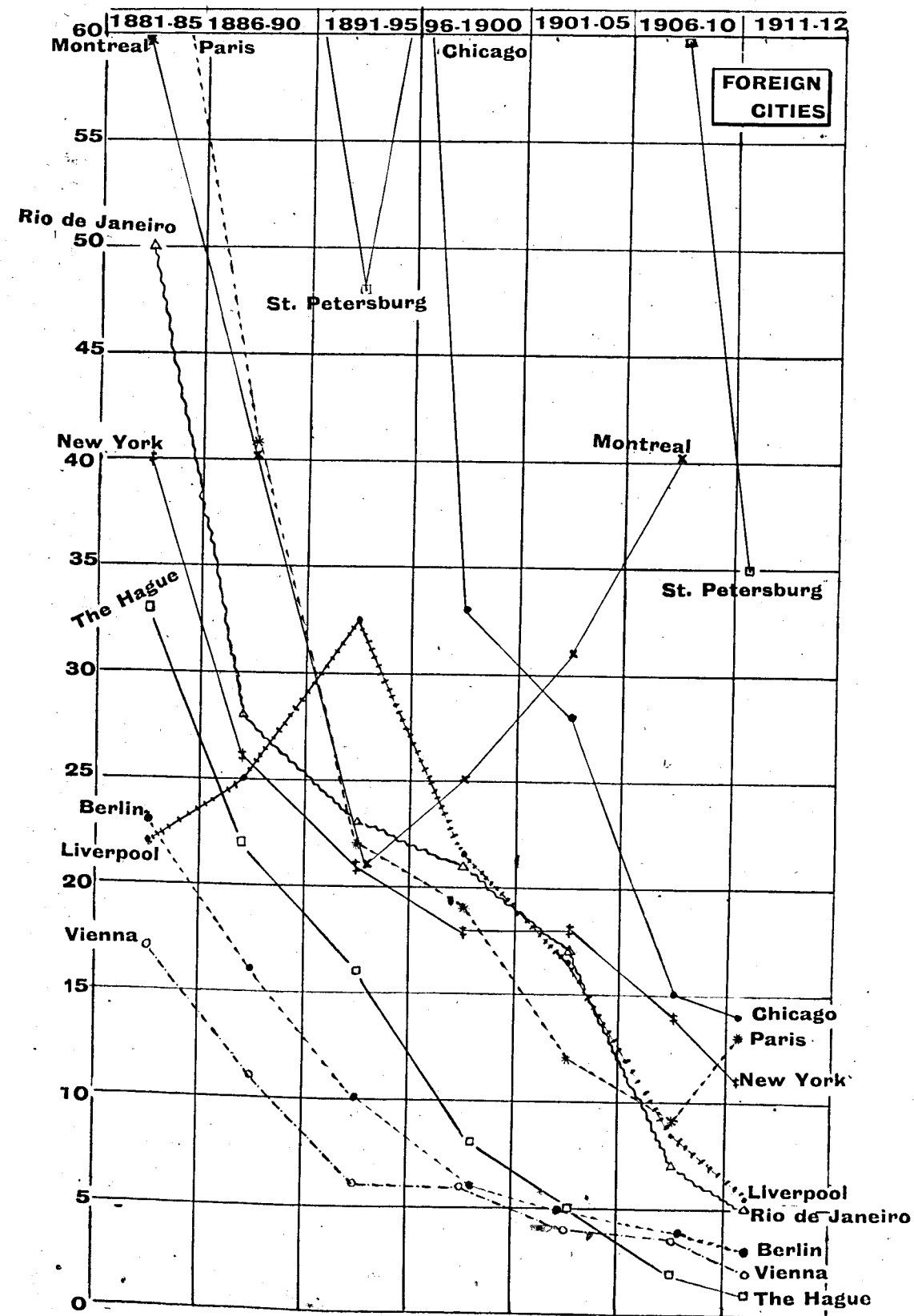


CHART II.

Enteric Fever—Death-rates per 100,000 Population.

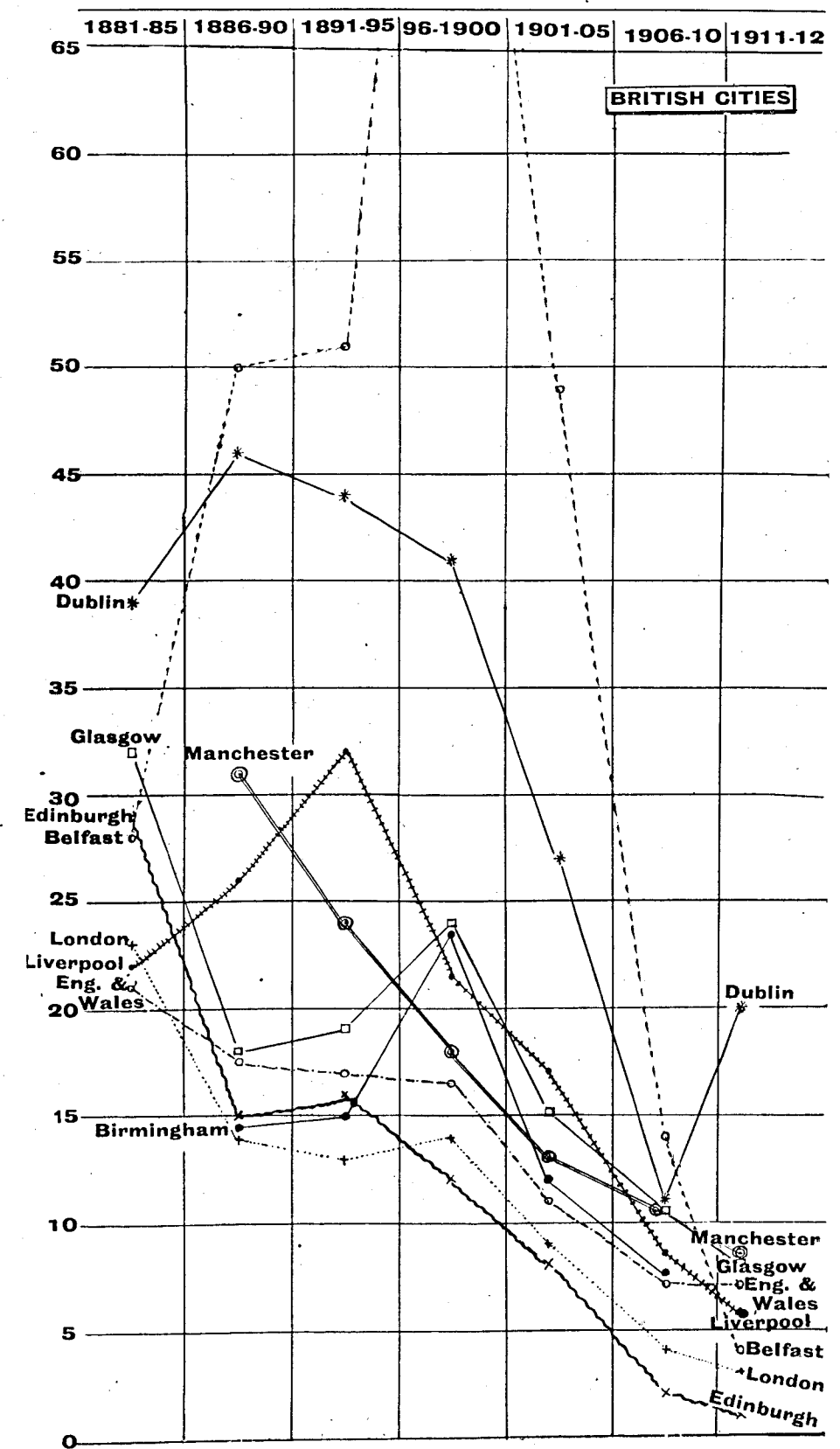
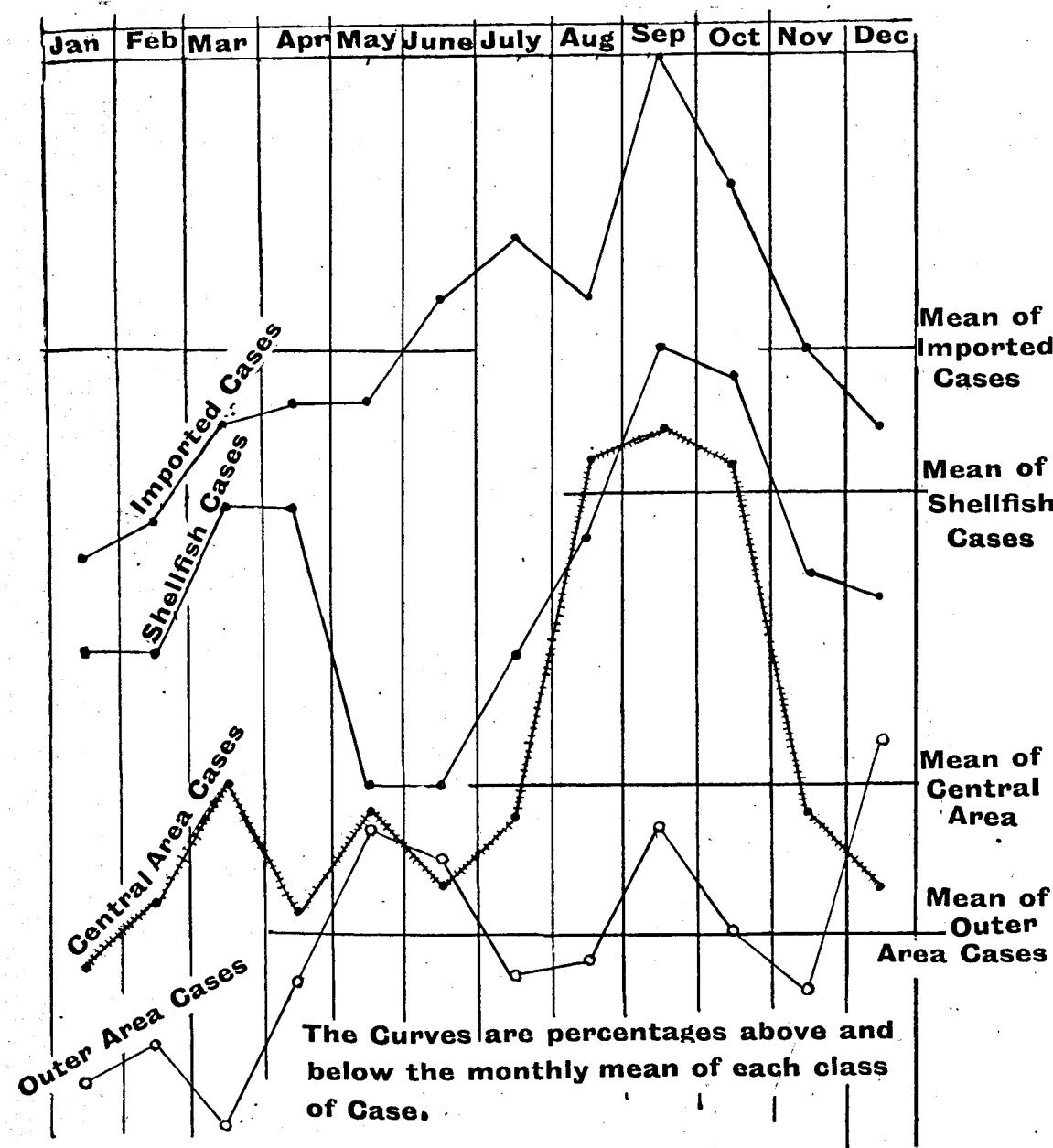


CHART IV.

CITY OF LIVERPOOL.

Seasonal Fluctuations of Cases of Enteric Fever arranged according to causation.



years of 1896 to 1907 the maximum was reached ten times in October, and only twice in other months—namely, August and March. But in the last five years the maxima were in May, December, January, October, and November. These late winter maxima point to shell-fish infection. The average maximum rise above the mean was 74 per cent. in the first period, and 54 per cent. in the second.

During the last three years I have investigated the causation of each case. The results of 500 cases are:—

26	per cent.	imported cases.
9	"	direct infection.
5	"	shell-fish cases.
1	"	milk.
5	"	probably not typhoid.

This leaves a residuum of 54 per cent. unaccounted for. If the city be divided up into a central area containing practically all the insanitary courts that remain and an outer sanitary area—the central area having a population approximately only one-fourth of that of the outer area—and these cases of unknown causation are similarly classified, then 23·6 per cent. occurred in the central area, 30·4 per cent. in the outer area. This gives a *threefold* excess in the rate of the central area, the approximate case rates being 0·26 and 0·085 per 1,000. This excess is, however, rapidly diminishing—as, indeed, is the whole of this residuum of cases of unknown causation.

The fourth Chart shows the seasonal distribution of these cases. It will be observed that the shell-fish cases mainly occur in late autumn, whilst imported cases show a maximum during the holiday season. The outer area cases show a very irregular seasonal distribution. The central area cases still show that regular autumnal curve that one associates with imperfect excremental disposal and carriage by flies.

The residuum of cases of uncertain causation has been a thorn in the flesh in a number of large towns. At the annual meeting of the British Medical Association at Liverpool last year there was some heart-searching as to whether these residual cases might not be due to water-borne infection. I am unable to accept this explanation; firstly, on account of the distribution of cases (even in the outer area they are not sufficiently sporadic); in the second place, Dr. Allan McLaughlin, of the United States Public Health Service, has shown that in cities with polluted water,

supplies causing endemic (not epidemic) prevalence of typhoid there is always an excess of infantile diarrhoea in the winter and spring. There is, of course, excessive infantile diarrhoea in many towns; but unless the water supply is polluted at least 75 per cent. of deaths from infantile diarrhoea will occur in the summer and autumn. There is no indication of this winter prevalence of diarrhoea in Liverpool, where over 90 per cent. of the diarrhoeal deaths occur in the summer and autumn. I do not know whether it occurs in any other of our cities.

In conclusion, now that enteric fever has almost reached extinction, I think that the time is fully due for legal powers to be given so that the shell-fish industry may be placed under sanitary control. It ought to be rendered impossible for occurrences such as are indicated by the Belfast curve to recur. I am given to understand that the milk-borne outbreak of enteric that occurred in one of our northern towns last winter was initiated by a dairyman infected by the consumption of shell-fish. There can be little doubt that other intestinal disorders of less severity than enteric are caused by contaminated shell-fish. The issue and enforcement of regulations under the Regulations as to Food Act governing the gathering and storage of shell-fish should give the final death-blow to this once formidable disease.

MEASURES AGAINST DIPHTHERIA IN HARBURG.*
—BACHMANN (Harburg) describes the measures adopted in Harburg, an industrial town of 70,000 inhabitants, in dealing with diphtheria. Bachmann avails himself of the services of Sisters of Mercy, who are equivalent in function to our health-visitors, and who visit the homes of patients suffering from diphtheria and supervise the general measures taken to avoid the spread of the disease throughout the household. A notice is sent by the police authorities to the house of each patient suffering from diphtheria, stating that the Sister named in the notice has been appointed to supervise measures for the control of the disease in the house, and urging the need for careful attention to any suggestions which she may make. Other children in the same household are excluded from school until they and the patient are free from diphtheria bacilli.

Final disinfection is carried out mainly by the occupants, under supervision by the Sister, and only where this is judged inadequate is disinfection performed through official agencies. The author propounds the aphorism that nothing needs disinfection which has not been infected, and he regards the furniture and trappings of a room as of very minor importance in the spread of the disease.

* Zeitschrift für Medizinalbeamte. No. 6. March 20, 1913.

THE DIAGNOSIS OF RINGWORM IN SCHOOL CHILDREN.

By A. F. BERNARD SHAW, M.B., D.P.H.,
Assistant M.O.H. and Assistant S.M.O. for the City of
Cardiff.

TO those engaged in the medical inspection of school children there is, perhaps, no morbid condition which presents greater difficulties in cure and prevention than ringworm of the scalp. The disease, though not injurious to the health of the child, exerts serious results on school attendance, and prejudices the education of the individual affected. For these reasons early and accurate diagnosis is essential.

There can be no doubt that prevalence of the disease is, in part, maintained by failure in recognising many conditions which, on careful examination, prove to be ringworm. These occur either as (a) very early cases, or (b) those which do not correspond to the classical type described in text books. Whilst on the other hand there are several diseases affecting the scalp which it is important to differentiate from ringworm. The disease being due to a parasitic fungus, it is obvious that there is only one method by which a true diagnosis can be made; that method is microscopical examination of the hairs.

The following technique—familiar to all—has the advantage of being both simple and rapid:

1. Wash suspected hairs in ether.
2. Mount in a drop or two of 40% Liquor Potassæ in the usual way.
3. Heat over flame for 30 seconds, but do not boil.
4. Lay aside for 5 to 10 minutes, and then examine with $\frac{1}{2}$ in. objective.

As a matter of routine the hairs to be examined should always be well washed in ether in order to remove oil globules. If this is not done—and more particularly if the patient has applied ointment—the surface of the hairs may be obscured by fat droplets, and the presence of the fungus missed. Further, it is possible to mistake oil globules for the spores; but whereas the former vary greatly in size, the latter are of the same dimensions. These points, though apparently trivial, will be found valuable in practice.

In the history of ringworm the names of two observers—Gruby and Sabouraud—stand out as having established fundamental facts; to Gruby (1843) we owe the discovery that the disease is due to a fungus; to Sabouraud (1894) we are indebted for the fact that not one, but

three species of fungi are concerned, each presenting distinct microscopic, cultural, and clinical characters.

By far the most common of these species—about 92% of cases—is the *Microsporon audouini* or “small-spored” variety. In this form the hairs in the affected patch are broken off $\frac{1}{2}$ millimetres beyond the level of the skin. Each hair is covered with a scaly sheath which has a “frosted” appearance. The area involved is covered with dry greyish scales. Microscopically, the sheath is found to consist of spores arranged in the form of a mosaic around the hair. For all practical purposes the *Microsporon* is always of human origin.

The other two species—named *Trichophyton endothrix* and *Trichophyton ecto-endothrix* respectively—occur in about 6% to 8% of cases. They are often termed “large-spored” ringworm.

In *T. endothrix* the affected hairs are sometimes broken off a considerable distance beyond the follicular orifice, and have no sheath.

In other cases the hairs are broken off at the level of the mouths of the hair follicles, and this gives the appearance to what is often called “black-dot” ringworm. The affected area is generally free of scales, and there is often complete baldness—“bald-ringworm.” Microscopically the spores are arranged in parallel chains like the beads of a necklace, and lie entirely within the hair. The parasitic elements are larger than those of the *Microsporon*. *T. endothrix* is also of human origin.

The third species *T. ecto-endothrix* usually exhibits well-marked characters. The infected hairs are broken off short. Each hair has a sheath, which, however, is limited to the intra-follicular portion, and is only visible on epilation. The diseased area is usually the seat of Kerion, i.e., suppurative folliculitis, and other inflammatory phenomena.

Under the microscope the fungus is found both inside and outside the hair. The spores tend to be irregular in distribution, but definite chains can be observed. Human beings acquire the disease from animals like the horse, dog, and cat.

The value of bearing these facts in mind is shown by the following observations.

During the routine examination of “seven year olds” in the boys’ department of a certain school, a child (W. T.) was found suffering from ringworm of the scalp, due to *T. endothrix*. This led to an inspection of all the scholars in the same standard that this case occurred in—

52 in number. Two of these were found to be suffering from scalp ringworm due to *T. endothrix*; all the others were normal. A systematic examination was then made of all the scholars in the boys’ school, but no more cases of *T. endothrix* were discovered. Some days later another case (R. L.) was found in the infants’ department of the same school. This child (R. L.) was a cousin of the first case (W. T.), and at intervals they lived in the same house. Careful inquiry led to the conclusion that the child (R. L.) had been suffering from the disease for a longer period than the others, and was, in all probability, the source of infection in the first instance. The evidence from these data suggest that the child (R. L.) transmitted the disease to his cousin (W. T.), who, in turn, infected two scholars in his own class. The four cases were excluded from school and subjected to treatment. The school was inspected two months later, but no fresh cases of ringworm caused by *T. endothrix* were found.

In the case of the *Microsporon* fungus—including as it does the vast majority of ringworm—it is impossible to trace the antecedents sufficiently far to be of any value from the preventive standpoint. The *Trichophyta*, on the other hand, by reason of their rarity and well-defined morphology, afford greater scope for successful investigation. It must not be understood, however, that in every case of *Trichophytosis* it is possible to trace the source of infection; more often than not examples will be found in which it is impossible for the school medical officer, limited as he necessarily must be in his methods, to determine the origin of the contagion.

In the earlier part of this article it was stated that the prevalence of ringworm in schools is, in part, maintained by failure to recognise (a) the early phases of the disease, and (b) atypical forms.

Unfortunately, in most text-books on dermatology, the clinical descriptions of ringworm are those of the disease in a comparatively advanced stage, and insufficient importance is attached to the initial lesions. As a result one comes to regard the condition as possessing but one phase, and that an advanced phase calling for prolonged treatment.

That early cases are not often seen is partly explained by the fact that they are overlooked during routine examination, and partly because they do not come for treatment. The writer has frequently observed such cases in children

belonging to a family one of whom had advanced ringworm; but he has found them apart from these conditions. As the *Microsporon* is the fungus most frequently found in scalp ringworm, it will be sufficient to deal with its clinical appearances in the early stage. In the first place, it is important to realise that invasion of the epidermis by the fungus precedes that of the hairs. This has been proved by Sabouraud through experimental inoculation in the guinea-pig, and explains the appearances of the initial lesions in man. As a matter of fact, the primary spot varies considerably in structure, in some cases a small red papule occurs near or around a few hair follicles, in others a minute erythematous spot is found which is slightly scaly. Sometimes the scales are sufficiently numerous to hide the erythema, which can only be seen on their removal. At this stage the typical “short hairs” are absent, seeing that the fungus is confined to the epidermis, or at any rate has only invaded the hair follicles to a small extent. The hairs, therefore, which are present in the affected spot appear perfectly normal to the naked eye, but if they are carefully examined under the microscope by the method already described it is nearly always possible to demonstrate the presence of the fungus. The disease, being early, the parasitic elements are few in number, and the conditions found are very different from those of the advanced stage. Spores are absent, or, if present, are few in number, and it is not advisable to base a diagnosis on them alone. The mycelial threads, or hyphæ, are the elements to be looked for. They will be found either inside or immediately outside the hair, and consist of irregularly-jointed filaments of a bluish-green tint, with a double contour. They are frequently branched in a V shaped manner, and tend to run parallel to the long axis of the hair. Their presence is sufficient to warrant a diagnosis of ringworm. If there is failure to find any fungus in the hairs, examination of the epithelial scales will usually give a positive result. Detection of the parasite is, however, more difficult in this case. During preparation many of the parasitic elements are washed away; various particles in and around the scales may resemble spores, while the outlines of the epithelial cells may be mistaken for mycelium. Consequently, some practical experience is required in the examination of hairs and scales, but this once obtained a diagnosis can be rapidly made. Recognition

of the fungus in the advanced stages is easy, in the early stages it is difficult. Occasionally in the primary lesion a few typical "short hairs" are found, and this occurs when the condition remains localised to the spot for some time, allowing extensive infection of the hairs. The diagnosis is then very easy.

Of the value of early recognition in ringworm there can be no doubt. It means more rapid cure, a saving in school attendance, and diminishes the possibilities of infection.

The second point to be considered is atypical forms of ringworm. By these are understood clinical appearances which do not correspond to the type familiar to all, and in some forms simulate other diseases.

In children the scalp is the site of a very common condition known by various names, viz., Pityriasis simplex, Seborrhœa sicca, or "dandruff." This affection is characterised by white dry scales, which easily fall off, and are symmetrically distributed over the scalp. There is no loss of hair. Ringworm may simulate this condition very closely. There are white dry scales, and no short hairs visible to the eye. If, however, the scales are lifted up typical hairs will be found projecting from their under-surfaces. There is usually some loss of hair, and the "scurf" is distributed in patches which are *not* symmetrical.

Some time ago the writer saw a girl aged 14 years who had a circular patch of thick "dandruff" limited entirely to the "vortex" of the scalp. There was no apparent loss of hair and no "short hairs" to be seen. The limitation of the scurf however aroused suspicion. Some scales were removed with the epilatory forceps and on examination showed "short hairs" heavily infected with the Microsporon. On inquiry it was found that the girl had been treated for ringworm two years previously and eventually returned to school as cured.

It may be taken as a sound axiom that the presence of "dandruff" in adults need never excite suspicion of ringworm, but its presence in children under 14 years of age should always call for closer investigation.

Another anomalous type of ringworm is termed the disseminated form. There are numerous spots about the size of a pea scattered irregularly over the whole scalp. Each lesion presents the typical "short hairs," etc. The skin between the patches is perfectly normal. The condition when the hair is long

is liable to be overlooked, but apart from that the diagnosis is easy.

In another form erythematous patches of variable size and shape are present, in which there is little scaling, and often no short hairs to be seen. It is frequently associated with considerable loss of hair. By pinching up the scaly portions with the epilatory forceps material will be obtained for a diagnosis. In some cases—and this is commonest in the T. endothrix species—there are one or more patches of complete baldness. There are no scales or short hairs, but often black dots will be seen, which are hairs broken off at the level of the follicular orifices. This form, called "bald ringworm," is liable to be mistaken for Alopecia areata. The importance of a correct diagnosis calls for no comment. By removal of the "black dots" and their examination the fungus will always be found.

Finally, the presence of associated inflammatory conditions, such as Impetigo, Folliculitis, abscess, and eczematoid eruptions must be borne in mind as tending to mask the presence of ringworm. If there is any suspicion of the latter, it is advisable to cure the inflammatory diseases first, in order to obtain a clear field for further investigation. Scalp ringworm presents so many appearances that it is impossible to describe them all, and the best guide to identification of the disease is to remember that its manifestations are almost protean.

The question of differential diagnosis does not, as a rule, present much difficulty, as there are not many morbid conditions of the scalp which closely resemble ringworm. Seborrhœa, or "dandruff," and Alopecia areata are the two diseases most likely to be confused with ringworm. In Seborrhœa the scaliness is symmetrically distributed and does not occur in patches. There is no loss of hair. In Alopecia areata the most careful examination will fail to reveal diseased hairs. The appearance of the bald spots, particularly when numerous, is so typical that no mistake can be made. Frequently, but not in all cases, the characteristic "note of exclamation hairs" (!) are present. These hairs are thinner at their roots than at their distal ends. Their presence is sufficient to diagnose Alopecia areata. The variety of ringworm known as "bald ringworm" is liable to be confused with this disease, "black dots" should be carefully looked for, and if found examined microscopically. The points in connection with this have already been considered.

Psoriasis affecting the scalp is usually very typical. The scales are heaped up in hard, dry patches, and have a "hillocky" feel when the hand is passed over the skull. Sometimes the disease spreads to the forehead beyond the hair zone, and produces the so-called "corona psoriatica." There is no loss of hair. Lesions will invariably be found on other parts of the body—especially the front of the knees and tips of the elbows—and at once settle the diagnosis.

Lupus erythematosus is excessively rare in school children. Affecting the scalp, it produces a perfectly bald patch of irregular shape, in which the skin is red, atrophic, and adherent to the cranium. Telangiectases are often present. The scales on the affected area are dry and tough. Associated lesions will usually be found on the face and hands and decide the diagnosis.

MEASURES AGAINST TYPHOID FEVER IN SOUTH-WEST GERMANY.*—In consequence of the excessive incidence of typhoid fever in South-West Germany, the efforts of the local official and voluntary agencies engaged in controlling the disease were reinforced in 1903 by a Government subvention. This grant was renewed annually and by the year 1912 had reached the very large total sum of nearly £900,000. The present volume is a memorial number, giving an account of the scope and results of the work. Most minute details of the bacteriological and other investigations made are given in its 700 pages of print. Over 10,000 cases of typhoid fever were investigated and treated, and it is of interest to note that the great majority of those in which the origin could be traced were due to direct personal infection, the agencies next in importance in the spread of the disease being water and milk. It is clear that the monetary aid given to the local authorities in question has been abundantly justified by the results.

MALARIA IN ITALY.†—CELLI gives a general *resumé* of the progress of the campaign against malaria in Italy. The main point of interest is the steady increase in the proportion of quinine provided by the State in comparison with the total amount of quinine in use in Italy. With this has been associated a steady decline in the amount of malaria. The quinine is given from the standpoint both of prevention and of cure. It is of interest to note that, as a result of the routine administration of quinine, the amount of malaria has diminished steadily in the army, and Celli remarks that a valuable social service has been rendered in restoring to health men who had been suffering from malaria prior to their entry into the army, and in maintaining in good health those not yet infected. In connection with general preventive measures reference is made to the fact that heavy oils are cheaper and less volatile than petroleum, but that they cannot be so completely relied on to form an unbroken film on the surface of stagnant water.

* Typhusbekämpfung im Südwesten Deutschlands (Arbeiten aus dem Kaiserlichen Gesundheitsamte, Band 41, 1912).
† Angali d'Igiene Sperimentale. Vol. 23. Fasc. 1. 1913.

THE PREVENTION OF ACQUIRED DEAFNESS.*

By MACLEOD YEARSLEY, F.R.C.S.,
Senior Surgeon to the Royal Ear Hospital, etc.

FIRST allow me to offer you my sincere thanks for the honour of reading this paper before you, an honour the more valued because I am proposing certain suggestions for the prevention of acquired deafness to an audience of preventive experts. You, of all members of our profession, are engaged daily in preventive medicine, and it lies in your power to promote measures to that end; hence your criticism and, better still, your co-operation will be of great value in the cause which I have so much at heart.

Our profession has, hitherto, taken deafness too much for granted. We have been concerned rather in discussing operative otology, the treatment of mastoid disease, intracranial abscess, and other complications, forgetting that these are really but bye-products, the beginnings of which can be prevented. We do not pay sufficient attention to the fact that deafness and the diseases of the ear which cause it lie in the realms of preventive medicine, and that it is to first causes we should give our serious attention. Far be it from me to decry the modern progress of aural surgery, which has been the means of saving many lives, but I feel that, did we but employ our best efforts in preventive otology, far greater results in the prevention of suffering and death would ensue.

In dealing with the prevention of deafness we are faced with two problems, the prevention of congenital deafness and the prevention of acquired deafness. The time is approaching rapidly when we must discuss the former, but the greater need for effort lies at present with the latter. Let us therefore leave congenital deafness now and deal only with the acquired variety.

Recently, the National Bureau for Promoting the General Welfare of the Deaf requested its standing Medical Committee, of which I have the honour to be chairman, to draw up practical suggestions for the prevention of deafness. This has been done, and it is those dealing with acquired deafness that I offer for your consideration to-day. We have urged them upon the London County Council, and have also brought them before the Central Health Committee for London at the Local

* Read before a Meeting of the Metropolitan Branch of the Society of Medical Officers of Health on 18th July, 1913.

Government Board. We feel that, could we have your sympathy and support, our cause would be strengthened very materially.

Our suggestions fall into two main groups, each of which is sub-divided into two, so that there are four in all for your consideration. These are:—

I. The prevention of the diseases which cause deafness—

- (a) Notification of all forms of meningitis.
- (b) Notification of all cases of congenital syphilis, with a view to the facilitation of treatment of mother and child.

II. The better management of ear disease when it occurs—

- (a) The appointment of an otologist on the staff of every fever hospital.
- (b) All aural school clinics and treatment centres to be in charge of a specialist or under specialist supervision.

Each one of these requires some explanation and, in order that this paper may be a short one, so that ample time for discussion may be afforded, I shall confine myself to the statement of facts.

The great majority of cases of acquired deafness is due to one of three groups of causes.

From my own figures, published in June, 1912, dealing with 723 cases, I give you the percentage relating to each cause:—

1. The Infective Diseases	343 or 47.4 per cent.
2. Meningitis	169 „ 23.5 „
3. Primary Ear Disease	211 „ 29.1 „
	723 100.0

I propose to deal first with meningitis. This is one of the most common and serious causes of deafness. Statistics given by different observers have varied from 12 to over 50 per cent. It is a condition which may arise from a variety of causes—epidemic cerebro-spinal meningitis, congenital syphilis, tubercle, scarlet fever, etc.—and these causes want careful study. It is no exaggeration to say that our present knowledge of meningitis is at about the same stage as that of typhus and typhoid was some 70 years ago, save that we have the advantage of being acquainted with micro-organisms as a cause of disease. In order that we may know more of the etiology of the various forms of meningitis, a disease which kills or maims thousands of children every year, research must be organised, and, that this may be done, it is necessary that all forms of meningitis should be notified, for purposes of study, treatment, and isolation. At a recent

meeting I was told by an eminent health expert that this would be scarcely possible, because it would entail so many autopsies. I would submit, however, that *post-mortem* examination is not the be-all and end-all of research, but rather enquiry into the circumstances, hygienic as well as bacterial, that lead to the condition.

The next suggestion deals with congenital syphilis. This is another disease responsible for much suffering and deafness. One requires to have had some experience of deaf-school work to realise the terrible nature of and the frequency of deafness due to this condition; but it has been said that it is doubtful if any disease, even tuberculosis, is so destructive of child life, or so disastrous to child health. It gives rise to a large number of cases of deafness during and after school life, and this is a result pre-eminently preventable. Years ago it was pointed out that when deafness and blindness arose as a result of congenital syphilis it was in those cases who were not treated during infancy. Most cases occur among the poor, because in that class the disease so often goes unrecognised and untreated. Were it made notifiable both mother and child could be reached and treatment facilitated, and I believe that were this done the results would be as successful as those which have accrued from the notification of ophthalmia neonatorum.

The second part of our suggestions contains two items, the first of which deals with fever hospitals. A great group of cases of acquired deafness owes its existence to the infectious diseases other than congenital syphilis, and of these the majority is due to scarlet fever, diphtheria, and measles. Notification and isolation have already done much to reduce the number of cases of the exanthemata, but ear disease, when it occurs during their course, requires to be dealt with more promptly and more efficiently. The ear complications of the infectious fevers are most serious and most dangerous to life and hearing. Scarlatinal and diphtheritic otitis tend to kill, though fatal results may be delayed for years. They tax the skill of the otologist to the utmost, but they can be prevented by timely treatment. Such treatment requires to be carried out by a specialist, hence our request that an otologist be appointed to the staff of every fever hospital. This request is not a new one; it was urged as long ago as 1904 by Dr. Knyvett Gordon, himself a medical officer at a fever hospital, and last year at the annual meeting of the British Medical Association at Liverpool the same

suggestion was unanimously agreed upon by the Otological Section.

Lastly, I come to the question of the treatment of school children. We urge that all aural school clinics or treatment centres should be placed in charge of a specialist, or at least under specialist supervision. If I may venture to speak personally, I may say that I have had considerable experience of ear work—an experience of over twenty years—and it has long been my conviction that this work can be carried out efficiently and adequately only by those who have been specially trained to it. This opinion has been strengthened and confirmed by special experience during the last seven years of ear disease from the aspect of the school child. Otology is a very special branch of surgery, and requires special skill and experience; and I am convinced that it is only by otologists that ear disease in children can be treated efficiently, and therefore economically.

Gentlemen, the National Bureau and its Medical Committee feel that, in taking up the prevention of deafness, it has assumed great and grave responsibilities. It is a great work, and we want the active co-operation of everybody. It is not the boulders of opposition which stop progress, but the mire of apathy. The former can be overturned, the latter clings and clogs. We ask you, as the pioneers of Preventive Medicine, to put your shoulders to our wheel, and help us all you can.

IGNORANCE OF THE MODERN WORKING-MAN'S WIFE.—Dr. Alfred Edwin Harris, medical officer of health for Islington, discussing infantile mortality in his annual report, says:—“Persons whose duty it is to inquire into the cause of child mortality invariably find that it is some neglectful act on the part of the mother, the result of want of knowledge. How can they expect otherwise when they find the young girl leaving school—without any conception whatsoever of the management of a house, without the faintest idea of the care of children, or the duties of motherhood—going straight to work in a workshop or workplace or laundry, and then getting married. Is it any wonder that we find so many working-men's homes in the muddled condition in which they are so frequently to be found? It is most painful to see the untidy conditions which prevail in their homes. If untidiness were the only factor, it might possibly be ignored, but when to this is added dirt and neglect, and the inability of the wife to cook the plainest food, the husband's state is not to be envied. . . . There are far too many men, who enjoy good wages, living in homes that are most unsatisfactory in every way.”

CONTACTS WITH ENTERIC FEVER PATIENTS ACTING AS CARRIERS OF INFECTION.

By GEORGE MACLEOD, M.A., M.B., Ch.B., D.P.H.,
School Medical Officer, Liverpool.

OUTBREAKS of enteric fever which are more or less wrapt in mystery are interesting from a clinical and from an epidemiological point of view, and it is on these grounds that one feels justified in seeking to obtain publicity for an account of the following series of cases, occurring as they did in a single household of eleven inmates:—

Case 1.—Where infection originated cannot be traced, but it transpired that a girl, H.K., aet. 16, complained of a “cold” at the beginning of January, 1912, and remained more or less ill, but continued at her work till the end of February, when the onset of comparatively severe symptoms necessitated her remaining at home and occasionally compelled her to seek rest in bed. She was thought to be suffering from “consumption” till, on 25th March, a positive Widal reaction confirmed the suspicion that her illness was really enteric fever, and she was removed to hospital, where she completed a clinical course of that disease and made a good recovery. In the meantime the house had been visited on 27th March and disinfection carried out, but there was no apparent indication of illness in any other member of the household.

Case 2.—After seven weeks' residence in hospital, Case 1 was dismissed on 15th May, and three days later, 18th May, her brother, G., aet. 13, was first noticed to be ill, and he was sent to hospital on 30th May, as a case of enteric fever. His Widal reaction was positive, and from the clinical manifestations he apparently passed through a primary attack of the disease.

Case 3.—The next case in sequence is the father, aet. 38, who, after careful consideration, dated the onset of his symptoms from 22nd May, and was at work till the 29th May. He gave a positive Widal reaction, was admitted to hospital on 1st June, and proved clinically to be a case of enteric fever of about three weeks' standing.

Case 4.—A girl, M., aet. 11, said to have sickened on 25th May, was removed to hospital on 30th, her Widal reaction being positive. She exhibited symptoms of a mild attack of enteric, the temperature subsiding to normal after eight days.

Case 5.—P.M., aet. 23, felt unwell on 26th May, continued at work till 28th; called in his doctor on the 30th, who, finding the patient slightly fevered, had him removed to hospital, where he gave no clinical evidence of the disease though his Widal reaction proved to be positive.

Case 6.—M.K., aet. 7, sickened on 31st May, and was sent to hospital on 1st June, where she was found to exhibit clinical symptoms of a mild attack of enteric, her temperature subsiding to normal after twelve days' residence. Her Widal reaction was positive.

TABLE I.
CASES SENT TO HOSPITAL.

Name.	Age.	Alleged date of sickening.	Date removed to Hospital.	Widal Reaction.
1 H.K.	16	Feb. 27th.	Mar. 25 to May 15.	Positive.
2 G.	13	May 18th.	May 30th.	"
3 G.J.	38	May 22nd.	June 1st.	"
4 M.	11	May 25th.	May 30th.	"
5 P.M.	23	May 26th.	May 30th.	"
6 M.K.	7	May 31st.	June 1st.	"

In this little outbreak there occurred cases ranging in severity from typical clinical enteric fever, through moderately mild and semi-ambulant, to cases which presented trifling and transient symptoms of disturbance, *e.g.*, Case 5; while the lower members (Table II) of the series, though apparently specifically infected, shewed no symptoms of disease at all, and it is on these latter that it is desired to focus attention.

Case 1 had clinically a primary attack of enteric; Case 2 sickened of a primary attack three days after the return of Case 1 from hospital, and was presumably infected from some other source. A period of 51 days elapsed between the removal of Case 1 and the sickening of Case 2, and even after allowing that Cases 3, 4 and 6 were, when admitted to hospital, entering on the third week of the disease, and giving them 21 days as an incubation period, there is still left a period of 33 days during which the disease remained latent in this family. A carrier was, therefore, sought for, but the closest scrutiny of the family history failed to reveal the presence of illness in any member of the household before or immediately after the removal of Case 1.

Bacteriological examination of the urine and faeces for *B. Typhosus* gave negative results on two separate occasions, but positive serum reactions were obtained in all but one of the remaining members of the household. These results are shown in tabular form:—

TABLE II.

Name.	Age.	Urine.	Faeces.	Widal.
Mrs. K.	35	—ne	—ne	Positive.
A.	6	—	—	"
L.	4	—	—	"
Mn.	1	—	—	"
H. (Case 1).	16	—	—	"
D.	17	—	—	Negative.

It would appear, therefore, that enteric fever was kept smouldering in this family by the agency of persons who, though specifically infected by the *B. Typhosus*, as evidenced, by their positive serum reactions, had not themselves suffered from the disease in any recognisable form.

Direct contact infection was easily obtained in a house of two apartments, where the sleeping arrangements were as under:—

TABLE III.

Recess beds in kitchen.		Recess bed in room.	Open bed in room.	Bedchair in room.
1.	2.			
Father (Case 3)	M. (Case 4)	A. (+ Widal)	P.M. (Case 5)	—
Mother (+ Widal)	H. (Case 1)	L. (+ Widal)	G. (Case 2)	—
Mn. (+ Widal)	My. (Case 6) (sometimes)	My. (Case 6)	—	D. (negative Widal).

Where bed infection failed food contamination was always possible: the mother did the cooking and H. (Case 1) before she was confined to bed was in the habit of washing the dishes and feeding the children. The only member who apparently escaped infection was the boy D. who enjoyed the privilege of a separate bed.

The literature on the subject of carriers is extensive and interesting. Chapin refers to the occurrence of carriers among contacts and among those who have not had the disease, and Hecker and Otto, in the summer of 1909, reported on a series of 319 men of the 10th German Army Corps who were exposed to specific enteric infection by ingestion. Twenty-seven clinical cases of the disease ensued on this infection and 97 more of those infected gave positive Widal reactions, while in three of these latter *B. Typhosus* was obtained from the faeces, but none of the 97 shewed clinical evidence of the disease. May examined 1,200 school children who came from districts in which enteric fever was endemic, and he obtained positive Widal reactions in 12, while in one of these *B. Typhosus* was transiently present in the faeces. In none of his cases, however, had enteric fever declared itself subsequently.

Though no cases of enteric could be traced to infection from the household referred to in

this paper, yet the potentiality for the spread of infection was great, and one is led to suggest that, especially where a case of enteric remains unrecognised at home for some time, an examination of the serum reaction and even of urine and faeces should be made in the case of contacts, just as swabbing of throats is done in diphtheria contacts.

It gives me pleasure to acknowledge my indebtedness to Dr. A. K. Chalmers, M.O.H., Glasgow, for the privilege of investigating this outbreak, and for his kind permission to publish this paper.

TUBERCULOSIS IN ESSEX.—A recent report of Dr. F. G. Bushnell, of Woodford Green, contains points of interest to those who are concerned in making provision for tuberculous patients. Dr. Bushnell is the tuberculosis officer of the western area of Essex, and he is thus able to supply figures showing that in 107 insured persons, 38 dependants and 11 uninsured persons, tuberculous arthritis was met with in three cases, active spinal caries in three cases, quiescent spinal caries in two, and affected lymph glands in six. Tuberculin was used for the purposes of diagnosis as well as for treatment. The results of the latter use are said to be "encouraging."

ON THE INCREASE OF MORTALITY FROM INJURY AT BIRTH.—In the July number of the Journal of the Royal Statistical Society, Dr. Reginald Dudfield calls attention to a remarkable increase in the number of deaths in England and Wales registered as due to injury at birth.

The average annual number of such deaths was in 1891-5, 101; in 1896-1900, 257; in 1901-05, 685; and in 1906-10, 885.

The mortality per 1,000 births was, 1891-95, 0.11; 1896-1900, 0.27; 1901-05, 0.72; 1906-10, 0.96. Ratios per 100,000 deaths, 1891-95, 73; 1896-1900, 178; 1901-05, 529; 1906-10, 810.

Dr. Stevenson adds a note that he is unable to offer any explanation of the increase in the figures except increase in the number of deaths so returned in certification.

FRIED FISH.—The medical officer of health of Wednesfield reports upon the frequency of cases of poisoning from eating fried fish and potatoes, and he suggests that the Council should consider the "putting of this occupation in the schedule of offensive trades." He says: "The main cause of poisonous symptoms from eating fried fish, etc., is due to the oil in which they are fried. The main symptoms of fried fish poisoning are vomiting, diarrhoea, prostration, urticaria, and a very itchy and unsightly rash. One of the clauses in the by-laws should be that fish must be fried in dripping or lard."

REVIEWS.

HYGIENE AND PUBLIC HEALTH. By B. M. Ghosh, L.M.S., and J. L. Das, L.M.S. Pp. 378. Illustrated. Price, 5s. net. Hilton and Co., Calcutta, 1912.

The need for a handy text-book of hygiene and public health in which special reference is made to tropical conditions has been felt until the past few years, and the book under review contains such a large amount of useful information that it will take a welcome place among several recent works which deal with the problems of tropical hygiene. Colonel Kenneth Macleod contributes a well-written introduction to the volume, in which he states that the merit of a treatise on hygiene depends on the clearness and accuracy in which it sets forth in plain and simple language the facts and doctrines bearing on the causation and prevention of disease and the most easy and effective manner of their practical application. The book by Drs. Ghosh and Das, so judged, possesses considerable merit. The large amount of valuable information which it contains, though this is presented in a very condensed form, should be clearly understood, more particularly by the medical reader. Of course, much information is given upon the application of the principles of hygiene and public health to conditions obtaining in India.

The consideration of the subject of dietary with special reference to India is a very difficult problem; a country inhabited by many varieties of people of different habits, customs, physical development, etc., naturally shows a considerable divergency in the food consumed. Hindoos from time immemorial have practised vegetarianism; even eggs are not eaten by them, although milk is not excluded from their diet. The authors state that those who live on such a dietary are lacking in what is called energy—which we must carefully differentiate from strength; the former being a property of the nervous system, the latter of muscle. We learn that in India starch, flour, or arrowroot are often added to milk as adulterants, and that chemical preservatives are not as a rule employed. "Toddy" in India contains only about 5 per cent. of alcohol, and is a fermented juice obtained from the spadix of the Fan palm, Bastard date, and cocoanut. With the Hindoos marriage is an obligatory religious sacrament, and is practically universal, and therefore the proportion of married persons of both sexes in India to the unmarried is considerably higher in India than in England. In a short chapter dealing with vital statistics it is stated that a method more accurate than the usual one would be to base the marriage-rate, for comparative purposes, on the number of unmarried persons living at marriageable ages!

It is interesting to read of the use of the "clearing nut," which is so often used in India to clear cloudy water. The authors state that one of these fruits is well rubbed in the middle of the vessel containing the water, which is then left to settle; in a very short time the impurities fall to the bottom, "leaving the water clear and perfectly wholesome." It would be interesting to learn what effects the "clearing nut" has, if any, upon the bacterial life in the water, and as to whether the rubbing of the fruit in the middle of the vessel containing the water would not generally add to the danger of bacterial contamination.

The writers would have been well advised to refrain in such a manual from making any attempt to deal with the subject of a chemical and bacteriological examination of water, etc. The sketchy outline given can serve no useful purpose, and the writers do not appear to have a first-hand knowledge of these matters. It is stated, for instance, that "the permissible limit of chlorides is 1.5 parts in 100,000"; and the reference to the bacteriological examination of water occupies only nine lines of print.

FIRST PRINCIPLES OF HYGIENE. By W. D. Sturrock, D.M. Illustrated. Pp. 256. Price, 2s. 6d. Clarendon Press, Oxford, 1913.

The writer of this small book states in his preface that he has endeavoured to keep in view, as a main principle, that hygiene should be considered as applied physiology, and that the first essential to any comprehension of the elementary laws of health is a proper understanding of the working of the body. This is a sound principle; but while the author's application of it is quite good as far as his treatment of matters physiological is concerned, the practical hygiene suffers by comparison with it.

Some opportunities are lost of pointing out the practical hygiene which the physiological facts justify and demand; although a considerable amount of useful information is conveyed. In some places the information given needs revision. For instance, on page 112, the souring of milk is attributed solely to the action of a special bacterium, and it is stated that it is legal at the present day to sell milk containing boric acid; on page 113 it is suggested that garget in cows is possibly a form of diphtheria; on page 121, in dealing with the tinning of food, it is stated that the tins must have "all the air taken out of them"; in dealing with the ventilation of houses there is no mention of Hinckes-Bird's useful and practical window device, while reference is made to Ellison's conical bricks, which have been but rarely employed in connection with houses, and are now off the market; Fig. 45 fails to represent a proper type of wash-down closet, and Fig. 47 does not indicate a suitably constructed cesspool and connections.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856. RECONSTRUCTED 1888.
INCORPORATED 1892.

Metropolitan Branch.—The annual meeting of the Metropolitan Branch was held at 4 p.m. on Friday, July 18th, at No. 1, Upper Montague Street, Russell Square, W.C. Present: Dr. E. G. Annis (President), Drs. Bond, Bryett, Davies, Wellesley Harris, Sandilands, Caldwell Smith, Spaul, Thomas (D. L.) and Porter (Hon. Sec.).

Visitors: Mr. Macleod Yearsley and Dr. Dan. McKenzie.

The minutes of the previous meeting were read and confirmed and duly signed. The Branch received and considered the report of the Council meeting held the same day and also received the report of the Hon. Auditors and the annual report of the Council. Dr. Fraser Bryett, medical officer of health, Metropolitan Borough of Shoreditch, was unanimously elected President of the Branch for the Session 1913-14. Dr. H. W. Roberts was elected Hon. Treasurer, Dr. Charles Porter, Hon. Secretary, and Drs. Wellesley Harris and Caldwell Smith, representatives of the Branch on the Council of the Parent Society. The members elected members of the Council of the Branch were, in addition to the officers and vice-presidents (Drs. Annis and D. L. Thomas), Drs. Allan, Bond, Brown, Davies, Kenwood, Millson, Priestley and Sandilands.

On the motion of DR. WELLESLEY HARRIS, a vote of thanks to Dr. E. G. Annis, for his services as President during the past year, and to Dr. Charles Porter, as Secretary, was unanimously accorded.

MR. MACLEOD YEARSLEY read a paper on the "Prevention of Deafness," in which, after pointing out that the majority of cases of deafness originated in childhood and were largely preventable, he asked for the help of medical officers of health in bringing about this prevention. The paper proved most interesting and instructive, and the suggestions which it contained were most sympathetically received. A short discussion followed, in which Dr. Dan. McKenzie and the majority of the members present took part. Finally the following resolutions were unanimously passed, and the Hon. Secretary was instructed to send them to the bodies concerned.

Resolution 1.—That in the opinion of this Branch the time has arrived when, with a view to the prevention of the occurrence of deafness following infectious diseases, the Metropolitan Asylums Board should consider the advisability of appointing a sufficient number of otologists on their medical staff.

Resolution 2.—That this Branch is of opinion that it would be in the interest of the public health, and assist in the protection of infant and

child life, if the Local Government Board issued regulations requiring the notification of cases of syphilis, congenital and acquired, and that following the method so successfully adopted in the case of tuberculosis, the Board should make provision in the first instance for such notification to the medical officer of health of sanitary authorities of the inmates of Poor Law institutions, and of persons under the care of district medical officers.

At the conclusion of his paper Mr. Macleod Yearsley was warmly thanked for his contribution to the proceedings of the Branch.

ANNUAL REPORT OF THE COUNCIL, 1912-1913.—Your Council have pleasure in submitting a report on the work carried out during the past session (1912-1913) by the Metropolitan Branch of the Society of Medical Officers of Health, under the presidency of Dr. E. G. Annis (medical officer of health of the borough of Greenwich).

The Branch held eight meetings—including one special meeting—and the Council three. The average attendance at the Branch meetings was 13, the highest number present at any one meeting being 18.

The details of the year's work may be summarised as follows:—

Tuberculosis.—Tuberculosis was the subject which attracted the greatest amount of attention during the year, and there was practically never a meeting held at which there was not some reference to it. That it bulked so largely in the minds of the members is easily accounted for. The parts of the National Insurance Act relating to sanatorium benefit came into operation in July of 1912; several orders and memoranda relating to tuberculosis were issued by the Local Government Board; temporary sub-committees of the London Insurance Committee were formed in the various boroughs, and the medical officers of health were called upon to prepare reports and attend conferences on frequent occasions throughout the year.

Papers.—Further evidence of the amount of attention the subject was receiving and the amount of thought and care which the members were giving to it is found in consulting the list of papers submitted at Branch meetings. Of four papers read only one had no direct bearing on the subject, viz., that by DR. BUTLER on the Report of the Special Commission on Intercepting Traps. The remaining three dealt practically entirely with tuberculosis. The first of this series was read by DR. SHRUBSALL, and referred to "The Selection of Patients for Sanatorium Treatment," and the second came from DR. CALEY, the medical officer of the Wandsworth Tuberculosis Dispensary, and was entitled "Some Points in the Treatment of Pulmonary Tuberculosis in Children." The third, submitted by DR. EASTES,

on "Bacteriology and the Milk Bill," related largely to tuberculosis in milch cows.

Discussions.—At the meetings at which no papers were read discussions were held. The matters dealt with were "Tuberculosis and the Temporary Sanatorium Sub-Committees," "The London County Council and Tuberculosis," and "The Public Health (Tuberculosis) Regulations, 1912." As a result of these discussions, a number of resolutions was carried, and copies were sent to various bodies. At a special meeting of the Branch held on Friday, January 31st, the Branch unanimously decided to nominate Dr. Chalmers, medical officer of health, Glasgow, as President of the Society for the session 1913-1914, and at a meeting held on April 25th the secretary was able to announce that the Society had elected the nominee of the Branch to the presidency.

Obituary.—By his death, towards the end of January, 1913, the Society lost Dr. J. F. J. Sykes, one of its oldest members. He had been President of the Branch, and was a regular attendant at the meetings. In the wider field of work of the Parent Society he had also been interested, and had had the honour to be elected to the presidency. At the special meeting of January 31st attention was directed to the loss which the Branch, the Society, and the service had sustained in the death of Dr. Sykes, and a vote of condolence with the members of the family was passed.

Nomination of President and Officers.—Your Council, by the powers vested in them under By-law 4, nominate as President of the Branch for 1913-1914, Dr. L. T. Fraser Bryett, medical officer of health, Shoreditch, and as officers, members of the Council of the Branch, and representatives of the Branch on the Council of the Parent Society, the Fellows whose names are appended:—*President*, Dr. L. T. Fraser Bryett; *Vice-Presidents*, Drs. E. G. Annis and D. L. Thomas; *Hon. Treasurer*, Dr. H. W. Roberts; *Hon. Secretary*, Dr. Charles Porter; *Representatives of the Branch on the Council of the Parent Society*, Drs. Caldwell Smith and A. Wellesley Harris; *Council of the Branch*, the above, and Drs. Allan, Bond, Brown, Davies, Kenwood, Millson, Priestley, and Sandilands.

Home Counties Branch.—The annual general meeting was held, by invitation of Dr. Howarth, the President, at the Meat Inspector's Office, 503-504 Central Meat Markets, Smithfield, E.C., on Wednesday, July 16th, 1913, at 3 p.m. Present: Drs. Howarth, Dundas, Tew, Laird, Beale Collins, F. Robinson, Holroyde, Lawrence, Strain, A. E. Porter, Roberts, Benton, Berry, Hewlett, Stevens, Linton, Bushnell, Warren, Johnston, Habgood, Paterson, Taylor, Dupont, Freeman, Sharman, Pierce, Chubb, Betenson, Thomas, Bail, Brebner,

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