

For the recognition of this condition he recommended that if there be a sudden chill followed by rise of temperature and sweating, at the time of the chill and previous to the giving of quinine, the blood should be examined. The plasmodium malariae would be discovered. For this kind of case the author strongly advised the administration of Fowler's solution till its physiological effect is produced. If the bowels are constipated and the liver inactive, Warburg's extract should be given in 5-gr. doses three to four times a day; if anæmia be present, quinine, iron and arsenic. Antispasmodic remedies are no doubt sometimes required as well in severe attacks, for example the smoking of cigarettes d'Espece or of datura tatula or of nitre paper. In extreme conditions of spasm, chloroform inhalations or hypodermics of morphia, or atropine become necessary. Gout and rheumatism were also sometimes connected with the nervous irritability underlying an asthmatic attack. When the attack is connected with gastric catarrh brought on by errors of diet or alcoholic excess, frequently lavage of the stomach and regulated diet bring relief. In asthma connected with bronchitis when the secretion is slight, efforts should be made to increase it; hence small doses of ipecacuanha, tartar emetic, chloride of ammonium, iodide of potassium or of grindelia robusta may be useful. When the secretion is abundant in the bronchial catarrh, belladonna or atropine may be used in small or moderate doses with the above-named drugs or with a little camphor or quinine in capsule or tablet form. When emphysema and bronchitis are clearly defined, antispasmodic cigarettes, inhalation of oxygen, Hoffman's anodyne, alcohol, hot coffee, ether, or chloroform may be tried. When in addition there is cardiac distension, nitroglycerine or the nitrites, salicylate of caffeine, either by the mouth or injection subcutaneously may be employed. Again, venesection or leeches, or wet cups to the chest or epigastrium, afford more or less lasting relief. Speaking very generally as to climatic treatment, the speaker was inclined to believe that the climatic conditions suitable for subacute or chronic bronchitis were also those desirable for bronchitis when complicated with asthma.

B.—DISEASES OF THE LUNG TISSUE.

(a) ACUTE PNEUMONIA.

The question of the treatment of acute pneumonia remains one about which much difference of opinion prevails. Remedies recommended at one time appear to have little effect for good at another; active treatment, palliative treatment, and no treatment

each has its day, and the mortality of the disease varies with the year or with the season.

It is now, however, generally thought that acute pneumonia is a specific disease, and that the micro-organism which produces it is the pneumococcus of Friedländer. In order to account for a difference in type which the disease presents, it has been suggested that the infection may be a mixed one, and that other microbes may enter into the production of the disease from time to time. This suggestion is based upon the fact that acute pneumonia occurs in connection with influenza, erysipelas, and the like, in which special microbes are known to be the exciting cause. As the disease is believed to be bacterial, most hope for cutting short the affection is placed nowadays in the production of an antitoxin, and experiments with antitoxic sera are increasing in number. Some of these experiments will be mentioned, but if the suggestion of a mixed infection, which has been discussed by Moore (*Brit. Med. Journ.*, Feb. 15, 1898), is a correct one, it will be seen that the production of antitoxin suitable for different cases becomes a complicated one.

The use of antipneumococcal serum.

At the Italian Medical Congress, Massalongo and Franchini reported some results obtained by them on treating cases of grave and acute pneumonia with Prof. Pane's serum. Ten cases were described. All of them were advanced and occurred in old people, and those who through poverty, fatigue, and vicious habits were nearly all alcoholics, with weak hearts, nephritis and arterio-sclerosis. Contrasting the results of this method of treatment with those obtained by other means in similar cases, the authors concluded (1) that the results were better and (2) that the serum had a direct action on the evolution of the pneumococcal process. In the discussion as to the value of antitoxins which followed the reading of the paper, a good deal of difference of opinion was shown to exist as to whether anything but an early injection was of any use, Bozzolo maintaining that unless used early they were of little use, whereas De Renzi considered that a later injection, even to the fourth or fifth day, if given in adequate amount and intravenously, might produce good effects.

From other directions opinions favourable to the trial of this serum have appeared, viz. from Ughetti, of Catania, and from Cantieri, of Siena, and from many others who have tried it. The serum is prepared at the Instituto Siero-terapeutico at Naples.

De Renzi (*Gaz. degli Osped. e delle Clin.*, Feb. 13, 1898, quoted from *Brit. Med. Journ.*) has used the serum with excellent results during the past three years. He has used it in thirty-two cases, and in the earlier years only in the severest cases; in

the past year fourteen cases were treated, with a mortality of 9 per cent. against 24 in previous years when former methods were in vogue. No bad results followed in any case.

The use of other sera.

Some few cases have been reported of the treatment of pneumonic patients with serum obtained from the blood of patients who have passed the crisis of the disease with apparently good effect, and other cases have been injected with serum from immunised rabbits. In all **Beverly Robinson**, of New York (*Med. Record*, Feb. 19, 1898), was able to collect upwards of thirty cases (we presume excluding those treated with Pane's serum) of pneumonia in the human subject, which had been treated by injection of serum either from convalescents from pneumonia or from immunised animals, with excellent results.

The use of creosote inhalations.

B. Robinson (*loc. cit.*) strongly advocates the vapour of creosote both as a prophylactic to prevent the spread, and also in the actual treatment of pneumonia. A drachm of creosote is dissolved in an ounce of spirit, and a teaspoonful of this mixture is placed in the water of the croup kettle. More is added as required. The inhalation of the creosote thus vaporised is employed for several days. At the same time, creosote may be given internally, but this method is not so successful.

The use of salicylic acid.

De Becker has employed salicylic acid in this disease for two years. He has treated twelve patients, of whom eleven have recovered. He has given 10 centigram. of salicylic acid every hour, but the dose must be adapted to the condition, the guiding symptoms being the expectoration. The acid is best given in a little hot water, a good quantity of jam or honey being added to it, but coffee, chocolate, or even diluted milk, will act as a good vehicle (quoted from *Brit. Med. Journ.*), and **De Renzi** recommends washing the mouth out either with salicylic acid (1 in 500) or with sublimate solution (1 in 5,000).

The use of salts of quinine.

G. Amoroso, of Naples (*Lancet*, Feb. 26, 1898), describes a form of pneumonia of which he had recently seen several examples characterised by high initial fever, mostly with strong rigors, subsiding after a few hours in well-pronounced diaphoresis, only to reappear with new though less strong rigors, the temperature still remaining high; lateral pain referred to a point; adhesive sputum mixed with blood, but not rusty; abrupt extension; tubular breathing, becoming all at once dull and bronchial; marked nervous depression and rapid enfeeblement of pulse;

scanty urate-laden urine, high-coloured; spleen enlarged; and diarrhoea sometimes frequent. Assuming the disease to be "pernicious," he employed strong doses of quinine, notably subcutaneous injections of the bichloride, $\frac{1}{2}$ gr. per injection. This method appeared to be successful, as the patient soon recovered, first from the external signs of distress, then from the fever, finally entering into speedy and steady convalescence. Considerable exception seems to have been taken to the idea of the author that this form of pneumonia is either uncommon or new, and **M. de Capoa** suggests that, under the influence of the prevailing influenza epidemic, typical pneumonia may be modified to produce such hybrid or capricious forms as that described by **Amoroso**. The point about the matter which is interesting to us, however, is that quinine in large doses may be tried in such cases with the likelihood of success.

In a paper by **M. H. Fussell**, of Philadelphia (*Med. News*, New York, March 5, 1898), giving an account of 134 patients with acute pneumonia treated in private practice, in which the mortality of all cases was about 16 per cent., the author sums up his experience of treatment by saying that it consists of **rest and the care of the heart**. Rest should be absolute, the patient not being allowed to leave his bed even to relieve the bowels, but making use of a bed-pan. In delirium a hypodermic injection of morphia should be given. As regards the heart, when in spite of absolute rest the cardiac action becomes weak, strychnia given hypodermically, digitalis or whisky, should be employed. As regards the administration of strychnia, a dose of $\frac{1}{20}$ of a gr. every three hours may be injected. This seems to act more powerfully than either digitalis or whisky, although both of these are often of value. Venesection, aconite, and veratrum viride the author has not employed. Poultices enveloping the chest afford relief sometimes when there is much pain. Cold baths when the temperature is high. Local application of cold, in the opinion of the author, has not proved very successful, but cold sometimes relieves pain. This last symptom may also be relieved by cups or opiates.

Premature resolution of the lung in acute pneumonia and its teachings.

T. F. Raven, of Broadstairs, gives an interesting account (*Practitioner*, Sept., 1898, p. 269) of a case of acute pneumonia with the very unusual complication or sequel of suppuration of the bronchial glands, forming a mediastinal abscess which discharged through the bronchi. The points about the case seem to be as follows:—A healthy boy of twelve years of age, who had been

previously suffering from a slight bronchial catarrh and had been exposed to the wind three days before, was seized with a rigor and frontal headache on Dec. 2nd. Temperature was 100° F. and pulse 116, with pain, increased by breathing, about the right mamma. Physical signs declared themselves slowly, and hepatisation was not apparent until the fifth day, when it involved the whole of the posterior aspect of the lung from apex to base (right side). On the sixth day moist crackling could be detected at right base and tubular breathing. On the seventh there was a temporary remission of symptoms and the temperature, which had been as high as 105° F., fell to 102.8° F. Physical signs as before. Four hours later the temperature rose again; the patient was sleeping badly and was delirious for the first time. Pulse 144, respirations 55, temperature fluctuating between 103° and 104°. A bad night followed, and next morning the patient was rambling. Temperature and pulse as before, but respirations quicker. On examination of his chest, however, practically the *whole of the physical signs had disappeared, breath sounds were normal, and percussion note good.* The lung lesion had cleared up suddenly. From this time and for twenty-four hours the patient was in a very precarious state, temperature rising to 105° F. necessitating cold sponging and packing in cold sheets. After a time the bad symptoms subsided, and for a week there was marked improvement. Physical signs were irregular; sometimes there was fugitive evidence of consolidation at one part of the right lung and then at another, but the morning temperature was 99°, and the evening never above 101°. On the 19th day new symptoms developed, the temperature rose to 103°, and there was dry cough of a very troublesome and exhausting character, almost like whooping cough. On the 24th day there were rigor and a temperature of 104.2°. At this time it was noticed that the heart apex was being gradually pushed over to the left; other things being excluded, a diagnosis of enlarged bronchial glands was made, probably suppurating and forming a mediastinal abscess. By the 28th day apex beat was two inches outside nipple, and a small quantity of pus was found in the sputum, which was also slightly blood-stained. On December 31st, on the 32nd day, expectoration of pus was repeated, and on January 4th a considerable quantity of the same material was brought up, estimated at half an ounce. From this time forth the boy steadily improved, and by February 15th was convalescent and able to take horse exercise, with normal weight regained, and heart apex in natural position.

From the history of this most interesting case, Raven suggests a view of the nature of pneumonia, which, if correct,

certainly should influence the treatment of the condition. As acute pneumonia is a constitutional one, of which the local manifestation is in the lung (this being shown first by the fever preceding the lesion; secondly, by the fever being in no direct proportion to the lesion, a small lesion being sometimes accompanied by a very high fever; thirdly, because when the fever terminates by crisis, the condition of the lung does not in the same sudden way show a diminution; and, fourthly, because inflammation of the lung from injury does not exhibit a clinical picture of the disease known as acute pneumonia), Raven suggests that the consolidation of the lung is not a mere local manifestation of the disease, but may be the main channel by which the disease is eliminated from the system. In the present case he suggests that the premature disappearance of the signs of lung consolidation showed that the useful process by which the poison was being eliminated was for some reason or another suddenly interrupted, that morbid products were absorbed, that they were arrested by the bronchial glands, which in consequence suppurated. If this suggestion is correct, it should naturally alter the present system of endeavouring by treatment to check or stop the inflammatory process of the lung. Assuming this view to be feasible, Raven *condemns the use of ice-bags* applied to the chest (when used to check the lung inflammation), and views with little favour the various methods which have been tried for the cure of pneumonia, from the application of heat or cold, the use of drugs, mercury, digitalis, aconite, and the like, brandy and blood-letting, to the more heroic methods of the injection of antiseptics into the hepatised lung, unless any of these remedies are employed for the relief of symptoms. There can be no doubt that if the lung consolidation is a conservative process, it would be folly to cut it short prematurely.

The use of compressed air in septic bronchopneumonia.

A. Abrams, of San Francisco (*New York Med. News*, Sept. 24th, 1898), draws a distinction between forms of bronchopneumonia and makes suggestions as to treatment. From notes of all the cases of bronchopneumonia seen during the last ten years, namely 61, the author says 25 were cases of tuberculous bronchopneumonia; that is to say, cases in which tubercle bacilli were found in the sputum; simple bronchopneumonia, the form usually recognised, 10 cases; non-febrile bronchopneumonia chronic, 15 cases; and septic bronchopneumonia, 11 cases. In all of them the pathological condition may be considered the same, viz. an accumulation of inflammatory products in the smaller bronchi and in the pulmonary alveoli, environed by hepatised tissue. Excluding

tuberculous bronchopneumonia and the ordinary form which in adults it is customary to regard as a foudroyant affection attended by pronounced dyspnoea, cyanosis, raised temperature, and symptoms of collapse, the author confines his attention in his remarks almost entirely to the non-febrile variety and to the septic form. The non-febrile form was made up of four cases which were subacute and 11 that were chronic; slight dyspnoea in five cases. Sputum nearly always contained staphylococci and streptococci. Physical signs were of bronchitis in the small tubes, discrete areas of percussion, dulness with broncho-vesicular or rarely bronchial breathing. In the septic form the clinical picture is practically that of tuberculosis of the lung, minus the presence of tubercle bacilli in the sputum, and eight of the cases were believed to be such before investigation by the author. The symptoms were those of sepsis, remittent and intermittent types of fever, night sweats, chills pronounced, and rapid emaciation, and the signs almost always at the apex. The sputum of these patients contained streptococci, staphylococci, bacilli coli communis and pneumococci in large numbers. The main difference is that the prognosis is good, cure being secured in the majority of cases by the *pneumatic cabinet, or by means of compressed air*. It is noted that the usual therapeutic methods were of little avail, but compressed air as administered in the pneumatic cabinet appeared to effect a mechanical dislodgment of the inflammatory and septic products from the small tubes and air sacs. In addition to this method iodide of potassium as one of the best of expectorants was administered by the mouth.

The above description of septic bronchopneumonia sheds considerable light upon certain cases which one has occasionally met with, in which a patient with all the usual symptoms of phthisis, and a considerable amount of sputum per diem, never has tubercle bacilli in the sputum. In one such case the sputum was examined over and over again, and the pathologist's report was, *no tubular bacilli, but almost a pure culture of pneumococci*.

(b) TUBERCULOSIS OF THE LUNG (PULMONARY CONSUMPTION).

1. The prophylactic treatment of consumption.

There can be little doubt that the interest in the subject of the prophylactic treatment of pulmonary consumption has markedly increased during 1898. This may be attributed chiefly to two causes: first, that the facts with regard to the method of the spread of tuberculosis by means of the sputum of patients affected with consumption, and of the simple means of checking that spread, have at last begun to make an impression upon the

laity; and secondly, because of the formation, under favourable auspices, of an association for the repression of tuberculosis, within the past few months. The object of this association is to disseminate knowledge concerning tuberculosis and its prevention, and also to help on the formation of sanatoria for the treatment of consumptive patients upon the open-air system. The new association has attracted much attention and has already been successful in exciting the public interest in the movement, which is described as "the new crusade against consumption." In this direction it has been greatly helped by the daily press. The danger to the community arising out of the careless treatment of the sputum, &c., of consumptive patients has been known for sixteen years—in fact, ever since the date of Koch's first announcement upon the subject in 1882—and for many years it has been the custom of those connected with hospitals, especially those devoted to consumption and chest disease, to impress upon their consumptive patients and the patients' friends, how they ought to act in order to avoid spreading the disease. All those interested in the subject must be sincerely glad that there is the chance of the whole question being taken up on a broader basis.

In order to prevent the spread of tuberculosis, measures of three kinds appear to be indicated:—

(a) With regard to the individual consumptive, that he shall not be a danger to the community in general, and to those in immediate contact with him in particular. These measures have chiefly to do with the destruction of all tubercular sputum, discharges, and excreta; his personal cleanliness and the proper cleansing and sanitation of the rooms in which he lives.

(b) The protection of the food supply of the community by the prohibition of the sale of meat or of milk obtained from tuberculous animals.

(c) The improvement of the general sanitary conditions of the people by means of which it is possible to prevent a condition of body predisposing to consumption.

The first two measures may be roughly said to be for the purpose of preventing the dissemination of the seed, the third in order to provide a resisting soil.

It will be of interest to note any evidence of the adoption of remedial measures in any one of these directions during 1898.

(a) With reference to **the prevention of the spread of consumption by the individual**, it may be noted that the leaflets upon the subject giving directions as to the proper method of dealing with sputum and the like, the proper cleansing of the house, the room, utensils, and so on, which up to a year ago had

been issued either by individuals or by consumption hospitals, are now beginning to be distributed by public authorities, following the excellent example of the Glasgow corporation in the matter, to which attention was drawn in last year's "Year-Book," pp. 25-27. The issue of literature upon this important subject is felt by some, however, to be insufficient for the purpose, chiefly for the following reasons:—First, because the classes for whom the leaflets are intended seldom read such papers carefully, even if they read them at all; secondly, that however carefully and simply the directions are drawn out, they are seldom understood; and, thirdly, that even when the directions are understood, they are seldom carried out. It is therefore urged by an increasing number of the medical profession that, if a system of compulsory notification of all cases of consumption were introduced, it would become incumbent upon the sanitary authority to see that the various hygienic precautions necessary to prevent the spread of the disease by or from the individual are carried out. This plan would, at any rate, do away with the present uncertainty as to whether the precautions recommended in these leaflets are really followed, which, as we have seen above, is extremely doubtful.

The **compulsory notification of pulmonary consumption** has been suggested for some years by experts upon the subject. In a paper upon "The Placing of Tubercular Phthisis under Control," by **Arnold Chaplin**, in the *Medical Magazine*, in May, 1893, this author summarises a number of additional regulations which might be expected to follow in the wake of the compulsory notification of the disease, which he strongly urged:—“(1) Prevention of patients with actual phthisis . . . from marrying; (2) prohibition of patients with actual phthisis from frequenting churches, theatres, railway carriages, tramcars, or any public place; (3) disinfection of sputa, habitations, and all things coming in contact with phthisical patients; isolation of the consumptive.”

It will be seen by this bare enumeration of a few of the sequences which might arise in connection with this subject that the problem is a complex one, and it is to this, no doubt, that we may attribute the unwillingness of the Local Government Board to take it up. We may assume this unwillingness from their action in the matter of the Town Council of Carlisle (*Brit. Med. Journ.*, May-21st, 1898). The Town Council of Carlisle adopted the suggestion of the Medical Officer of Health for the borough, that it would be advisable to place phthisis, tuberculous meningitis, and tabes mesenterica upon the list of notifiable diseases. Application was in due course made to the Local Government Board

to have these affections so dealt with under the Notification Act of 1889. The reply of the Board was as follows:—“The Board are not prepared to approve of the resolution on the subject passed by the Town Council.” The official view of the Board may also be inferred from the remarks made by **Sir Richard Thorne**, its chief medical adviser, in his recent Harben lectures (*B. M. J.*, Nov. 19, 1898). The lecturer stated that he agreed with the central authority, on the ground that there was no such similarity between phthisis and the diseases now notifiable as would, in his opinion, justify compliance with the demand to include it under the notifiable diseases. In spite, however, of this decision of the Local Government Board, it will be generally acknowledged that the question seems to be emerging from the ideal into the region of the possible.

It is interesting to note what may be called an **experiment in notification** attempted by a semi-public body—viz. the **Jewish Board of Guardians**. This well-known corporation, which has done so much to alleviate the condition of the Jewish poor in the East End of London, has taken two important steps in the direction of preventing the spread of tuberculosis among that class of the community. In the first place, a special committee of the Board has made an exhaustive inquiry into the alleged prevalence of consumption among the Jewish poor, the result of which appeared to prove that, allowance being made for the augmentation of the Jewish population in the East End of London during the past fifteen years, while there has been no increase in the relative prevalence of phthisis, there has been an increase in the number of cases of chest complaints generally. Secondly, the Board, with the object of preventing the spread of consumption, etc., has decided to issue to visitors among the poor, for their own information, the pamphlet by Russell, of Glasgow, “A Popular Exposition of the Modern Doctrine of Tuberculosis,” and, for distribution among the poor, copies in English and Jüdisch, with certain modifications, of the leaflet issued by the Health Committee of Glasgow to all ratepayers of the city. These leaflets are for the purpose of calling attention of the poor to the facts which have been demonstrated within these later years in connection with consumption, and to point out the nature of the disease, the means by which it may be controlled, and its communication from the sick to the well, stopped. The visitors are further instructed, by means of a carefully-worded letter issued to them by the Board, **to read over and explain the leaflet** to any consumptive patients they may visit, and are particularly asked to lay great stress on the *wickedness* of

sufferers expectorating elsewhere than into proper receptacles, such as are mentioned in the said leaflet. Visitors are further requested to notify to the Board the names, etc., of any cases of consumption they may meet with, so that, after verification by medical certificate, the patients may be visited by a sanatory officer, who will advise as to the sanitary measures necessary. In case of necessity, assistance will be given to provide spittoons, separate beds, disinfectants, and the like, or to carry out such washing and disinfection as may seem expedient in all cases of tuberculous diseases in which there is a discharge. It is to be noted with pleasure that the Board carefully cautions the visitors to explain to the poor that they do not lose their independence by accepting the advice and help tendered to them on their cases being reported to the Board, but, at the same time, warns them lest the tendering of advice and sanitary inspection should become the means of pauperising. All cases will be thoroughly investigated before help, in the form of money or the free grant of sanatory appliances, is given. The Board has further asked the assistance of the medical officers of the hospitals chiefly frequented by Jews to notify to them the names, etc., of any Jews who may be found to be suffering from tuberculosis.

It will be seen from the accompanying summarised report of the Commission of the Academy of Paris for combating Tuberculosis that in some respects their recommendations go beyond anything which has been urged in Great Britain with reference to the recognition and isolation of the tuberculous. Compulsory notification does not, however, appear to be recommended. Although, in part, these recommendations have to do with the question of animal tuberculosis, which will be treated of later, it will be as well to insert them here, as they are of general interest.

Grancher (May 3, 1898) brought up this report, which concluded with the following recommendations:—

(1) The Academy confirms the three recommendations of 1890, viz. as to the sputum being received in proper spittoons containing a solution of carbolic acid, 5 per cent., or water; secondly, as to doing away with sweeping for the removal of dust, and the substitution of washing or rubbing with a damp cloth; and thirdly, as to boiling of all milk, whatever its source, before drinking.

(2) As to the appearance of the disease in private practice, the Academy recommends to all medical men the persevering application of measures of prophylaxis against tuberculosis as soon as a diagnosis has been arrived at. They also recommend that the disease should, if possible, be kept in a quiescent state by early diagnosis and appropriate treatment.

(3) As regards the army, soldiers in whom tuberculosis has been diagnosed should be invalidated temporarily, as long as their sputum does not contain tubercle bacilli, and permanently as soon as it does.

(4) The heads of schools, factories, and shops should be urged to carry out the simple and easy means which are sufficient effectually to prevent the extension of tuberculosis.

(5) In hospitals the commission recommends (a) that tuberculous patients should be kept separate in special wards until new (special) sanatoria can be provided. (b) Antiseptic precautions should be taken in the cleansing of both tuberculous and general wards, especially by the cleansing of the floors and the substitution of washing for sweeping. (c) The improvement of the conditions of nurses by higher pay and retiring pensions. (d) The formation of a staff of sanatory officers for the hospital.

(6) The Academy approves of the laws already proposed for the treatment of meat from tuberculous animals. Tuberculin is recommended to farmers, &c., for the separation of tuberculous animals.

(7) Finally, the Academy, wishing to show the exceptional interest which attaches to the continuity of its action in favour of prophylaxis, has formed a permanent commission under the name of "Commission for the Prophylaxis of Tuberculosis," the object of which will be to encourage and co-operate with any effort against the dissemination of the bacillus tuberculosis. (*La Sem. Méd.*, May 4, 1898.)

(b) As regards the **prohibition of the supply of meat or milk from tuberculous animals**. Without going into details in the matter, it must be noted that since the report of the Commission on Tuberculosis has been issued, there have been in several directions indications that public bodies are inclined to carry into effect its recommendations. This is certainly the case with regard to London and Manchester. (*Brit. Med. Journ.*, Nos. 1972-1973.) These recommendations (not in order) may be put shortly thus: (a) Compulsory notification of every disease of the udder of cows. (b) Powers to exclude from a district milk from cows with tuberculosis or exhibiting clinical symptoms thereof, and powers to slaughter such cows subject to compensation. (c) Provision of public slaughter houses with inspectors to be engaged to inspect all animals immediately after slaughter, and to stamp the joints of all carcasses passed as sound. (d) Inspection of all meat not slaughtered at the public slaughter-houses at proper places for such inspection, and all meat brought into the district from elsewhere. (e) Power to take samples, and make analyses from time

to time of milk brought into the district, and to make milk vendors supply sufficient information as to sources from which their milk is derived. At ports where milk and milk products are received from foreign countries, any costs that may be incurred in their examination to be borne by the importers. The London County Council have notified to the Local Government Board that they are prepared to carry into effect these recommendations, and Manchester has instructed the Town Clerk to apply to Parliament for powers for dealing with the milk supply, similar to those obtained by Glasgow in 1890. These powers are chiefly to enter cowsheds where cows are kept for furnishing milk to the city, to examine any cow to see whether it is suffering from any disease which renders milk dangerous or injurious to health, and to deal with dairymen or cowkeepers who keep cows which have been officially declared to be suffering from tuberculosis or other disease, which might render the milk dangerous or injurious to health. When these powers are conferred upon local authorities generally, the danger of tuberculous infection from meat or milk will be very considerably reduced.

(c) Then as concerns **the improvement of the general sanitary conditions of the people**, we have at least two ways pointed out to us in which some of the conditions which help in producing phthisis may be avoided. First of all, by improved ventilation, and secondly, by improved drainage. Both these points are insisted upon by the Massachusetts Board of Health in its conclusions relating to the prevalence of tuberculosis in the state. It strongly insists that one of the chief conditions favourable to the production of the disease is the continuous and habitual breathing of unrenewed air; consequently, in workshops, factories, school-rooms, public buildings, halls, churches, and the inhabited apartments of dwellings and tenement-houses, the absence of adequate means of ventilation must conduce to the danger. Of course, dampness of the soil on which a house stands and dampness of the immediate neighbourhood tend to the same result, as does naturally the occupancy of living- or sleeping rooms or apartments which are constantly damp, or are partly or wholly underground. Another factor inducing the spread of this disease was found to be the presence of dust in the air of apartments, factories, mills, and workshops; hence necessarily, occupations or trades, in which men, women, and children are exposed to the inhalation of irritating dust, must increase the liability to contract phthisical ailments. (*Lancet*, June 4, 1898.)

Again, in a report on the mortality of phthisis as affected by the operations of the Board in the metropolis of Sydney (N.S.W.),

Kendall draws these important conclusions: (a) That there is an undoubted relation between the incidence of phthisis and the dampness of the soil. (b) That as the phthisis death-rate has been reduced in those districts provided with proper sewerage since the laying of the main sewers, the laying of the main sewer has exercised an influence over the phthisis death-rate through drying of the soil. (c) That in view of the success which has attended the Board's operations up to the present time, the extension of these operations will prove of great benefit in coping with the disease called phthisis.

2. The treatment of consumptives in sanatoria.

It will readily be acknowledged that if a duty is imposed upon the individual consumptive so to act that he does nothing to spread the disease of which he is the subject, a duty quite as strong is imposed upon us to see that each consumptive is placed in a condition as favourable as possible for improvement or recovery. Some would go even further than this and say that if no chance of improvement exists, every incurable consumptive should, if necessary, be taken care of in a suitable home or asylum until his death. In the past, the duty of specially caring for the consumptive in Great Britain has been recognised by the establishment of special hospitals, and no one will deny the excellent work which has been done by these institutions. In all the special chest hospitals in the kingdom, however, there are very few more than 1,000 beds, of which London provides over 600, and this is obviously insufficient. Granted the need for further accommodation for the consumptive, it is generally conceded that this further accommodation can best be supplied in the form of sanatoria, in which it would be possible to follow out the plan of treatment which has been so successful on the Continent, viz. the open-air treatment. We have accumulating evidence from experiments which have been made on a small scale in England, that this treatment is successful even when the exact climatic peculiarities of the Continental sanatoria cannot be repeated; in other words, as put in a leading article in the *Medical Record*, "the general methods of treatment are of greater importance than the climate."

The next question is: By whom are these sanatoria to be provided? Many say without hesitation, "By the State or municipality." Knopf, of New York, for example (*Medical Record*, September 24, 1898), in an extremely vigorous and comprehensive review of the whole subject says:—

"If any government is in earnest in its endeavour to combat tuberculosis effectually, besides its regularly enforced laws against bovine tuberculosis, its thorough hygienic and prophylactic