

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



measures against tuberculosis in man through sanitary regulations and published instruction, it must take upon itself the care and treatment of the curable and incurable cases of tuberculous patients among the poor and among those with limited means. I mean here by limited means a financial condition which does not permit a tuberculous patient to enter a private sanatorium or to have at home such medical, hygienic, and dietetic care as will assure him the best possible chance of recovery."

If compulsory notification of tuberculous diseases be established, it will naturally follow that accommodation for the phthisical will have to be provided, if need be, by the State in some form or other.

At present, both notification of tuberculous diseases and the provision of State sanatoria for consumptives belong to counsels of perfection, and local effort of some kind will have to be depended on; and indeed a great deal may be done by local authorities. There are many indications that the public is taking an interest in the matter, and in Edinburgh, for example, we are told by the *British Medical Journal*, "the trend of opinion is undoubtedly in the direction of the corporation providing hospital accommodation for consumptives" (October 8, 1898). We also learn from the same source that in Liverpool the guardians of the West Derby Union have under consideration a proposal from their medical superintendent of the Infirmary, Nathan Raw, to establish a sanatorium in some suitable locality in the country for the open-air treatment of the large number of consumptives for whom the Board is responsible (October 22, 1898). As regards the poor in receipt of parish relief, suffering from this disease, it is only fair that they should have a chance of life given them by definite treatment. When they become ill they must be looked after by the State, and the result is that we have the sick poor collected together into huge infirmaries under the care of two or three medical officers to each infirmary. The phthisical are practically untreated in such places.

It has been suggested that sanatoria should be established in connection with all town hospitals at suitable places in the country, so that each establishment would be able to treat its own cases of phthisis. If this could be done it would obviate the collection of large numbers of the phthisical at any one place. The chief argument against the idea would seem to be the expense. That some plan of the kind is possible has been demonstrated in London by the North London Consumption Hospital, which has its out-patient department in town with its hospital at Hampstead, and also in Edinburgh by the Victoria

Hospital, which has its out-patient department in the heart of the town and the hospital at Craighleith. A report of the treatment pursued at this latter establishment by R. W. Philip (*British Med. Journal*, July 23, 1898), is of great interest. The hospital is situated about a mile to the north-west of Edinburgh, on a gentle slope, facing south. It is an old mansion adapted to its present purpose, standing in seven and a half acres of grounds which include a beautiful park and gently-inclined lawns and winding paths. The accommodation is at present unfortunately small, viz. for seven male and eight female patients, but a considerable extension may shortly be expected. In this hospital the patients are able to experience the good effects of sunshine and fresh air in a life spent as much as possible out of doors, with a special and liberal dietary and graduated exercises. The summary of his results, by Philip, is very modest. He says: "In so chronic and treacherous a disease it is not wise to speak confidently of cures effected. The proportion of patients, however, who have left the hospital and maintained for years continuously good health and been able to resume regular work, perhaps with a change of employment, is a large one. The list includes cases where both lungs and larynx were involved on admission. On the other hand disarrangements are frequent. Some of the most promising cases have returned on our hands or have gradually fallen back elsewhere. The proportion of these cases is larger than it should be from causes over which we have meantime no control." These causes appear to be that the treatment is seldom sufficiently prolonged, the patients being in poor circumstances and so compelled too soon to resume the conditions of life which induced the disease. Moreover, the hospital accommodation being small and the demand great, the stay of the patient is too often curtailed.

If provision be made in sanatoria for the very poor there still remain the wealthy and those of limited means. As regards the first of these, the question of sanatorium accommodation is of little moment; if open-air treatment is ordered they will have it! For those of limited means it may be presumed that the new association will help to found suitable institutions in which small charges only will be made for daily keep.

It will be interesting to add a note upon the experimental treatment of consumptives on the open-air system (of which mention has already been made) in Great Britain.

Burton-Fanning has given an interesting account of his employment of some beds at a convalescent home at Cromer, in connection with the Norfolk and Norwich Hospital, to test the practicability



of treating phthisical patients on the hygienic methods of the German, and with encouraging results. Jane Walker had similarly treated a small number of patients in a very healthy part of Norfolk with excellent effect. Denton Johns and Pott, both of Bournemouth, have been able to show that the south coast of England is as good as the north for the so-called pure-air treatment of consumptives. All of the results so far, although dealing as yet with comparatively small numbers of patients, indicate the value of still further extending such experiments. It appears likely that before very long we shall have many more sanatoria for consumptives in Great Britain. According to Rufenacht Walters there are already forty-three in working order in Germany, of which seventeen are for patients paying from £3 to £6 per week. In America there are nineteen, besides one in course of erection. The same author (*British Med. Journ.*, October 15, 1898) goes on to say, "sanatoria are intended for presumably curable patients; advanced and incurable cases should be sent to special homes or refuges. Sanatoria should not, if possible, be the property of individual physicians. They should be rendered self-supporting."

#### Results of treatment in the Loomis Sanatorium.

The Loomis Sanatorium is situated about 100 miles from New York, on the Catskill Mountains. The climate of Liberty and the site of the sanatorium seem to be particularly adapted for the treatment of pulmonary tuberculosis during the whole of the year, but particularly during the winter months. The elevation is 2,300 feet, the atmosphere is dry and the sunshine abundant, and the winds which have prevailed (north-west) have not been at all detrimental to the patients. At any rate the results of treatment according to the latest report are very good. During the first year the sanatorium was opened 8 per cent. of patients lost their tubercle bacilli; during the last six months of the report 18 per cent. During the first period 73 per cent. gained in weight, during the second 81 per cent. More important still, during the first period 13 per cent. were discharged apparently cured, while in the last six months 23 per cent. were in that condition. Last year 10 per cent. were discharged with the disease arrested, and during the last six months 9 per cent. It is a rule in the institution to allow patients whose evening temperature does not reach 101° F. to indulge in moderate exercise, and if the temperature does not exceed 99° F. no restriction whatever is placed upon the amount within reason of the exercise taken.

In the report it is to be noted that a good many drugs have been used, *e.g.* creosote and its derivatives, especially valerianate of guaiacol; ichthyol in keratin-coated pills when intestinal

complications have arisen, and seemingly with success. Serum treatment has also been tried, twenty-nine cases in all, of whom seven, or 24 per cent., lost their tubercle bacilli, and in 48 per cent. the bacilli decreased in the sputum. In an examination of fifteen cases treated by the serum method not one case, it is stated, had redeveloped the disease, but all had been enabled to remain in their homes and at their work.

#### 3. The feeding of consumptive patients.

In a very amusing account of his recollections as to the treatment of consumption in his early days, Sir Samuel Wilks (*Practitioner*, June, 1898) gives some simple general principles which he has had in mind in treating consumptives during his professional life. These may be shortly summarised. He had urged change of the circumstances in which the disease had developed; change, including living as far as possible in the air and leading a simple animal life—the locality for the change not being of first moment but depending upon circumstances; as medicines, he had ordered, perhaps, tonics, and cod-liver oil. He had always laid stress, however, upon sunshine and air. He concludes his reminiscences with these words: "The only remedies I know for consumption are *air* and *sunshine*—air, air, fresh air." If one might be allowed to add another and a third remedy, it would be—*good food*. Of the importance of feeding in consumption there can be no doubt, and feeding after a special plan is adopted in all the sanatoria upon the Continent. A very simple demonstration of the same fact is seen in the hospital treatment of the poor. It almost invariably happens that consumptive patients, unless too far gone to benefit by any treatment whatever, begin to gain weight, sometimes very rapidly, as soon as they are admitted into hospital, in whatever way they are treated, if they can take food; the difference between the hospital food and what they have been in the habit of obtaining at home being so marked. The patient is able both to take more and to digest better what he takes.

R. W. Wilcox, in an interesting clinical lecture (*New York Med. News*, July 7, 1898) strongly emphasises the **importance of feeding in the treatment of consumptive patients**. Feeding must rank with other natural methods of improving the general health, and of so preparing the tissues that the specific bacilli will cease to grow in such a soil. He described the method of "forced feeding" about which we hear little nowadays, and as the observer appears to use this method in some cases, it may be interesting to recount his experience of it in Paris sixteen years ago. The treatment is known as the "*Debove*



*method.*" Lean meat is taken, all fat, tendon and cartilage being removed, and the remainder chopped fine, dried in an oven at 150° F. until absolutely dry; the temperature is then raised about 30 to 40 degrees. When perfectly dry the meat is ground up in a mortar and sifted. Six pounds of beef are reduced to 1 lb. of beef powder. The patient's stomach is first of all washed out and then about  $\frac{3}{4}$  lb. of beef powder are introduced into the stomach, and three times as much milk. All is left in the stomach, and the meal is repeated twice a day. Gradually the amount of the beef powder and milk is increased, until the patient takes from 1 to 1½ lb. of powder and 4 to 5 pints of milk per diem. If there is trouble in digesting this the milk is omitted and a little acid is added to the powder. As a sequence of this treatment the observer states that hopeless cases of tubercle of the larynx and lungs gain weight and are relieved. This method of forced feeding, Wilcox states, he employs now in cases of tuberculous laryngitis, in which every act of coughing and swallowing is painful. By a preliminary application of cocaine to the larynx the stomach-tube may be inserted without pain, and enough of the prepared food may be inserted at one sitting to nourish the patient for twenty-four hours. In this way a great deal of discomfort is avoided. The distressing vomiting which occurs in some of these cases is by means of this method obviated. The observation is founded on large clinical experience.

Wilcox summarises in a few words what he considers the true diet of consumptives, "meats, starches, and fats, with an excess of the latter and a certain amount of phosphates"; and while insisting upon the golden rule of food, "early and often," recommends the separation of the meals into those containing the bulk of the starchy food and meals containing the bulk of the proteids. Three hours or three hours and a half should be allowed for the digestion of the heavier meals, so as to be sure the stomach is fairly emptied before the next consignment of food goes into it. He recommends (but not with great heartiness) the semi-solid, not the liquid, malt extracts to help the conversion of starch into sugar.

#### 4. Treatment of consumption by special methods.

##### (a) Koch's tuberculin (old).

Little has been done during 1898 to test the value of this remedy further, but there have been some short notes about former patients upon the subject, which it will be of interest to mention.

Heron (*Brit. Med. Journ.*, July 7, 1898) says, of the thirty-seven patients treated in 1891 with Koch's tuberculin, five were cases of lupus; these have all relapsed. Of the remaining thirty-two

cases, all of lung tuberculosis, eight have died, eight are fairly well, while of the remaining sixteen no reports have been received.

McCall Anderson (*Brit. Med. Journ.*, Oct. 1, 1898), who has been in the habit of using both the old and the new tuberculin, considers the former to be useful (a) as a diagnostic test (this is generally admitted), (b) as a means of discovering additional foci of disease, of which there is no evidence whatever at the bedside, and (c) as a curative agency. As to its value in the latter capacity, he gives an account of two cases in which tuberculin appeared to have procured great improvement or absolute cure.

Boardman Reed, of Philadelphia (*Intern. Med. Mag.*, Aug., 1898), states that several medical men in America have continued to use tuberculin cautiously in suitable cases, with encouraging results. His own results in 1892-1893 with small doses of the remedy were in the main favourable, but not often striking.

##### (b) With Koch's tuberculin R.

It will be remembered that Koch's tuberculin R was introduced to the notice of the profession in the spring of 1897, in a paper in the *Deutsche medicin. Wochenschrift*, No. 14, and, although in the course of a few months several reports upon its use had appeared, it was generally felt that a longer time should be allowed to elapse before any conclusions for or against the remedy were enunciated. Eighteen months or more have now passed by, and we may begin to form some idea as to the position this method of treatment is to occupy, but even now it is too soon to draw too definite conclusions.

In the discussions which have taken place on the Continent upon the subject, we must confess that the majority of opinions seem to be against the remedy. Early in the year, at The Charité, Berlin, Hüber reported that he had treated four non-tuberculous and fifteen tuberculous cases, of which four came within Koch's severe indications. He concluded that TR was generally neither harmful nor beneficial; the good results sometimes obtained might well be attributed to improved hygiene and diet. Burghart arrived at much the same conclusion. His experience was with five pyretic and five apyretic phthisical cases. As a rule there was a gain in weight. He regarded the reaction as more severe than from the old tuberculin, and yet not so characteristic, for persons in good health as well as sufferers from other affections might react with fever. In Leyden's clinic, up to last spring, it was stated there had been no success with TR. Patients appear to acquire an immunity to reaction, but there seems to be no improvement of the tuberculous deposits. In some



cases there is some general improvement, but disappearance of physical signs has not been noted. The conclusion arrived at at The Charité is that TR cannot be considered better than other forms of treatment, which are less expensive and less worrying in every way. This opinion is also held at Gerhardt's and Senator's clinics.

It was disappointing to find that so little discussion upon the merits of TR took place at the annual meeting of the Congress for the study of Human and Animal Tuberculosis, held in Paris this summer (July 27, 1898, to August 8, 1898). The reports were too scanty. Neglecting the test experiments on animals reported by Arloing, Courmont, and Nicholas, of Lyons, who were unable to confirm Koch's statements, the experience of Landouzy (six cases), Leclerc, Lyons (eight cases), and Vagnier, Villiers-sur-Marne (five cases); all reported against the usefulness of the remedy in treatment. Bourhial, Algiers, had tried TR in doses up to 9 milligrm., and obtained nothing but ill-effects. Benoit, of Paris, who had tried the remedy both experimentally and clinically, however, considered that in early cases it was beneficial and might even produce cure.

We have seen few reports as to the employment of TR in phthisis in England. As a matter of fact, it does not seem that many are testing the remedy. One thing against it is certainly its expense. It was recently stated by an expert that a complete course of TR for a patient might be considered to cost £12 or £13, or possibly a little more. We have, however, reports from Heron (*Brit. Med. Journ.*, July 9, 1898), Raw and Abram (*Lancet*, July 23, 1898), and from McCall Anderson (*Brit. Med. Journ.*, Oct. 1, 1898).

Heron has used the new tuberculin R in nine cases of phthisis (chiefly at the City of London Hospital, Victoria Park), not one of which, he tells us in a very interesting summary of his results, was within the limits laid down by Koch, of the cases likely to derive benefit from the treatment. The typically hopeful case has rarely a temperature above 99° F., and the disease is confined to a small area of one lung. Such cases are exceedingly rare in hospital practice, at any rate in Britain. Of the cases taken, some being typically bad ones according to the same view of the subject—that is to say, being the subjects of extensive lesions on both sides, two died, and seven did well. The autopsy of one of the patients who died showed that there was no recent excavation; the other case was complicated with appendicitis. The diseased appendix was removed in the course of treatment in the hospital. Of the patients who did

well, the reporter is careful not to say that they were cured: "without exception they left the hospital at their own request, stating that they felt well enough to return to work, and wished to do so. They had all improved in health to a remarkable degree." Heron states that in no case has he heard of any one of these patients so treated having relapsed since discharge from the hospital, although several of them have left nearly a year. The conclusions which Heron arrived at from this experience of tuberculin are of practical value, although the cases treated were comparatively few. They may be thus summarised. In the first place, when the treatment is carried out with care, he has never seen any harm arise from the use of the remedy. He has seen the treatment do good in cases of early phthisis, but as regards advanced cases, he considers the discomfort inseparable from the use of the hypodermic syringe, to which many persons are exceedingly sensitive, is not sufficiently outweighed by the slight chance there may be of possible good from the use of tuberculin. As regards cure, as mentioned above, he feels unable to speak, because there is a possibility of the most favourable of the cases suffering relapse. Finally, he inclines to the belief that the new material is of more value than any other drug in the curative treatment of very early stages of tuberculosis affecting the lungs (or skin).

Raw and Abram treated in all (at the Mill Road Infirmary, Liverpool) thirteen cases of phthisis by this method, and their results may be epitomised as follows:—Of the thirteen cases of phthisis treated, four are completely cured. They all gained in weight, the physical signs noted on admission have disappeared, the tubercle bacilli are absent, and the patients at the time of writing are quite well. (A tabular analysis is supplied in the report.) In case 2 the treatment was stopped, as the disease steadily progressed, and weight was lost. In case 4, severe reactions followed the injection of 4 milligrammes on three occasions, and as weight was lost, the treatment was given up. In cases 6 and 7 reactions followed the smaller doses, weight was steadily lost, and the treatment was abandoned. In case 9, the whole of the right pleura was thickened, and the patient became hectic and lost weight. In case 11 no alteration for better or worse occurring, the treatment was abandoned when immunity doses had been reached. In case 8, which was hardly a suitable one, reactions were early and severe, and the treatment was abandoned on reaching 1 milligramme. In seven cases the blood corpuscles were counted whilst the treatment was being carried out. In two the number



of red cells was increased, in five diminished; in four cases the white cells were increased, and in three diminished. The authors come to these conclusions: "From a very careful observation of the effects of tuberculin R, given alone in doses as prescribed by Koch, and not accompanied by any other treatment, on cases of phthisis pulmonalis, we are able to announce four cases of complete recovery out of the thirteen cases treated. These four cases were the most favourable for treatment, as the disease was localised, and the temperatures were not such as to suggest mixed infection. We feel that this result is little, if any better, than that of ordinary treatment, combined with nourishing diet and hygienic surroundings."

McCall Anderson, who does not give statistics, as they are too often unsatisfactory, with less experience of the new than the old tuberculin, is inclined to think that the former is the safer of the two, because in appropriate doses it produces much less reaction, but for that very reason is not so reliable as a diagnostic test. A serious objection to the TR is its cost, particularly when the higher doses are reached, which precludes its use among the poor. The final dose of the old tuberculin costs less than a penny, whilst the final dose of the new is 17s., so that it may be considered mainly a luxury for the rich.

(c) **With other tuberculins.**

The report of the committee of the Cooper Medical College upon Hirschfelder's method of treatment of pulmonary consumption by oxytuberculin, is distinctly favourable to its continued trial. Hirschfelder, of San Francisco, as long ago as February, 1896, presented some account of a new treatment of consumption by what he called oxytuberculin. He showed at this time a number of patients who had been treated with good effect. He was advised to withhold the results from publication until further experience had confirmed his previous results. In April, 1897, he read before the State Medical Society a paper embodying further results. A preliminary account of this method was contained in last year's "Year-Book," p. 42. With the various communications upon the subject from the author of the method before them, the Cooper Medical College determined to investigate the matter, and a committee was appointed for the purpose. This committee has repeatedly witnessed the culture experiments in the laboratory, and has also examined the fifteen patients who have been under treatment for from two to several months during the past two years, together with their histories, bacteriological specimens, and the corroborative evidence of other physicians as to the

diagnosis. Two of the patients presented a mild form of the disease, in five it was pronounced, in four the lung was very seriously involved, and the remaining four seemed hopeless. There is no reason to doubt that all were cases of tuberculosis. Fever, cough, sputum, hæmorrhages, night sweats, etc., had been present in nearly all, physical signs and bacilli in all. In many the diagnosis had been confirmed by other physicians. Physical examination of many of the cases was made by the members of the committee. No evidence of present tuberculosis could be discovered, although in some old cavities were found. The concurrent testimony of all, except two or three recent cases, was of complete return to health, so far as appetite, weight, and vigour are concerned. No cough, expectoration, hæmorrhage, or other symptom of disease was present. The conclusions of the committee are as follows:—

(1) Oxytuberculin prevents the growth of tubercle bacilli in veal bouillon.

(2) A positive therapeutic value has been demonstrated for it in the fifteen cases examined, the more clearly as no other treatment was used.

(3) No dangerous or untoward effects have resulted from its use.

(4) It has been legitimately brought before the profession, since a full description of its mode of preparation has been published, thereby putting it within the reach of all. Finally, the committee feel justified in certifying these facts to the profession, to the end that oxytuberculin may be thoroughly tested, the limits of its successful application determined, and its place in therapeutics established at the earliest possible time. While some remarkable results have been obtained in advanced cases, no claims are made for the later stages of the disease. The report is signed by Drs. L. C. Lane, Ellinwood, Barkan, Plummer, and H. Gibbons.

Hirschfelder read a further communication upon the results of the oxytuberculin treatment at the Paris Tubercular Congress in July, but without throwing more light upon the matter. There seems to have been no expression of opinion upon the subject at the meeting. We do not know whether the remedy has been tried in Great Britain.

H. P. Loomis, New York (*Medical Record*, May 21, 1898), says: "As far as my personal experimentation with this anti-toxin on animals goes, it does nothing." It does not delay the development of tubercle in guinea-pigs as claimed by the inventor. In one human experiment no benefit was derived from its use.



At the Paris Congress in July, also, Denys gave an account of some results he had obtained with a *new form of tuberculin* (a full and detailed description of which he promised when his method was perfected). According to this account, in six cases of febrile tuberculosis with moderate or slight lesions, the temperature was reduced, and improvement took place; in forty-eight cases in which there was cavitation but not extensive invasion of the lung, and little fever, no fewer than fifteen were said to have been cured, twenty-five were improved, two remained stationary, and six died. On the other hand, in the last stage of tuberculosis, no improvement took place in the nineteen cases tried. The use of the remedy should be continued for six to twelve months or longer. The dose begins with very small amounts, and like tuberculin R is gradually increased.

(d) **With antituberculous sera.**

At the ninth International Congress of Hygiene and Demography, held at Madrid in the spring, researches with the serum of the donkey were reported, in the joint names of G. Perron, A. Gimeno, and Jean Torres Babi, which, if supported by further observers, should accentuate the difference between primary tuberculous infection of the lung and secondary infection.

In the first place, these observers obtained serum from donkeys (? immune to tubercle), and this, when injected into guinea-pigs, rendered these animals immune to tuberculosis. After this they used the serum in cases of human tuberculosis, and also obtained good results as far as external tubercle (lupus, etc.) was concerned. When, however, they applied the remedy to the treatment of lung tubercle, the result was different. At first the symptoms of the disease were improved and the tubercle bacilli in the sputum diminished, but, on the other hand, the streptococci and the staphylococci pyogenes markedly increased. In two cases tubercle bacilli actually disappeared from the sputum, but with this disappearance hectic fever set in, and the patients died, one in eight and the other in ten days, with the symptoms of septic poisoning. From these researches the authors conclude that pulmonary tuberculosis and phthisis are distinct from one another. The serum appears to produce immunity from tubercle bacilli, but has no effect in producing immunity from the streptococci and staphylococci. The phthisis is a result of the primary action of the tubercle bacilli and of the after-action of the other microbes. The hectic fever, night sweats, purulent sputum may be supposed to be due to the after-infection. The authors are of opinion that it is unwise to attack one part of infection without simultaneously attacking the other. They suggest that in order to procure a

serum which will attack both of the two agencies which are in operation, serum from donkeys which have been rendered immune both to the bacillus of Koch and to the streptococci and staphylococci found in phthisical sputa should be employed.—(*Lancet*, April 30th, 1898.)

In connection with the above researches, the very important **question of the mixed infection of pulmonary phthisis** comes in. This is no new question, as the possibility of the infection in cases of phthisis not being purely of tubercle bacilli was recognised by Koch early in his researches. It is, however, coming to the front by reason of the influence it exercises upon treatment, as the bettering of the conditions of patients by stopping the secondary infection and its effects may often be expected, even in cases in which the primary disease is hopeless. Michaelis has demonstrated staphylococci in the blood of eight out of ten tuberculous patients, and these results have since been confirmed. It was, however, shown that these organisms were of very slight virulency. Petruschky made a similar observation with regard to the streptococci which he had been able to demonstrate in the blood of tuberculous persons. A careful study of the relations of the bacteria other than tubercle bacilli in such cases by Davidsohn induced the idea that amyloid disease might be experimentally produced. On experiment he found that it could be produced only with injections of staphylococci and their products. Streptococci did not lead to this degeneration, neither did putrefactive or other more virulent bacteria. Tubercle bacilli of themselves appear to be unable to produce it.

In February last an institute was opened in Rome for the supply of the **Maragliano serum** free of charge to the poor suffering from tuberculosis. The plan was chiefly promoted by Silla Passarini, who, on a tour of the Italian centres of population where tuberculosis is most frequent, had his own convictions as to the efficacy of the serum confirmed by the leading practitioners in those centres, and accordingly considered the time ripe for the opening of a dispensary in Rome so as to place the prophylactic and curative remedy within the reach of the humblest. Passarini, with a staff of assistants, agrees to undertake the consulting practice of the institute, and to be responsible for the diagnosis of the cases for which the serum is specially indicated, and Maragliano to supply the serum gratis. The establishment of this institute appears to show that the opposition to the use of the serum has, at any rate, died down, and that the remedy has "vindicated its right to citizenship" in the medical commonwealth (*Lancet*, Feb. 12th, 1898). It will be recollected that Maragliano's serum



is obtained by treating horses with tuberculin and then with virulent cultures of the tubercle bacillus. Walter James (as reported by Loomis) has employed the serum with much care and for a long period in the treatment of a patient, but reports that the said patient received no harm, but absolutely no benefit. (See "Year-Books" for 1896, 1897, and 1898, p. 38.)

(e) **Other Methods.—Treatment by means of Röntgen's rays.**

This method was suggested first of all by Glover Lyon, who made some experiments upon the subject without any definite result. Since then the rays have been used a good deal in the diagnosis of tuberculosis of the lungs with good effect, recently in Great Britain, for example, by Hugh Walsham (*Lancet*, Oct. 15, 1898), and more occasionally for the purpose of treatment. Von Sinapius has written a short *brochure* upon this subject, the basis of which was the treatment of a dozen cases of phthisis. He claims that they have been cured or improved. The method adopted was to expose the patient's bared chest to the perpendicular rays, in various places, for ten minutes at a time. The sitting lasts for an hour, and is repeated daily for three weeks or longer. Under the treatment cough and expectoration improved, and sometimes completely stopped; physical signs diminished. The after-history of the cases is not given.

**Treatment by electricity.**

Wassilieff (*Klin. ther. Wochenschrift*, 22, 1898) proposes a method of treatment of pulmonary diseases by static electricity, which (so it is stated), if it does not cure phthisis, at any rate comes near doing so. The patient, seated upon an insulated stool, inhales for five minutes a discharge of electricity, which is directed towards his mouth. At first he feels a dryness of the throat and giddiness. Sometimes the head breaks out into a light perspiration. At the end of six or eight sittings the expectoration diminishes, the sleep is improved, and night sweats disappear. In certain cases there is cicatrisation of vomicae. Non-tuberculous catarrhal and hypostatic pulmonary troubles can be entirely cured in from two to eight weeks. The author's experience extends over four years.

**5. The treatment of consumption with drugs.—The use of creosote, guaiacol, creosotal, and guaiacol carbonate.**

An accumulating amount of evidence has been brought forward in favour of the use of **creosote and some of its**

**derivatives** in the treatment of phthisis. Many important reports have been published during 1898 upon the subject. Of these, that by Lamplough may be considered particularly valuable. He gives an account of 100 consecutive cases treated with large doses of creosote (pure beechwood) at the City of London Hospital, Victoria Park. Of these 100 patients, to whom the drug was given in doses gradually increasing to 40 minims three times a day, only 5 were unable to continue to take it. Two of these were women with very advanced disease, both of whom died within three weeks of their admission to the hospital. The third objected both to the smell and taste of creosote; the other two preferred cod-liver oil. Of the 95 patients, 85 took 40 minims three times a day and 10 took a drachm three times a day. Of the 100 patients, 62 had disease of both lungs and 18 showed signs of cavitation; many were of an acute type; 3 had diarrhoea and 4 had albuminuria. In all doubtful cases the drug was not prescribed until tubercle bacilli had been found in the sputum. In 68 cases the symptoms either partly or entirely disappeared, the patients increased in weight, and the temperature fell in cases where there had been fever or remained unchanged in non-febrile cases. The average stay in the hospital was two months, and the average increase in weight was 4 lbs. The physical signs improved in many of the cases, but two months would be too short a time to expect the physical signs to show as much change as the symptoms; and in cases which have continued creosote for longer periods, the treatment being continued in the out-patient department, the improvement has been marked. The albumen disappeared from the urine of those who had presented this symptom, and in two out of three cases the diarrhoea also stopped.

Of the remaining 32 patients, 5 could not take the drug, as above mentioned, 15 did not materially alter, in 7 the disease showed signs of advance, and 5 died under treatment. Lamplough concludes his report with the following propositions:—

1. The best beechwood creosote can be given with benefit, in amounts varying from 120 to 240 minims daily, in cases of pulmonary tuberculosis.
2. The drug is best administered in cod-liver oil or in a spirituous solution, and in some cases the "creosote chamber" or ori-nasal inhaler may be ordered in addition, with advantage.
3. The dose should be small at first, but it can be rapidly increased to 40 minims three times daily for an adult. In three cases doses of 30 minims three times a day were well borne by children.