

and of long experience, is entirely responsible for all male hospital patients; he has an assistant nurse under him, and only has temporary charge of the male imbeciles when their regular attendant is on leave of absence. The statement made by the matron to our Commissioner is as follows: "There is a nurse for this block (male block), she is assisted by the male nurse for the dressings, and heavy cases, and he has charge of all the male patients in the house and the imbeciles." The female nurse of the male block was off duty when the visit was made and the assistant female nurse was on duty in that block. 7. Two nurses are on duty at night, and have been for many years. Our Commissioner states that the information given was that there was one night nurse on duty, but that owing to the representations of the officials, more nurses had been appointed; we regret if we have made this statement on imperfect information, and it may be that the discrepancy arose in not distinguishing between the nurse and her assistant.

We give space to these corrections as received from Dr. Bale, but they leave untouched the overcrowding, the imperfect sanitary arrangements, the insufficient and untrained staff of nurses, the absence of classification, the neglect to provide proper furniture in the nursery, or a paid nurse for the infants, and other details. We see that the Guardians at their meeting, when they considered Dr. Bale's answer to our charges, congratulated themselves that the report only told them what they knew before; this may be a satisfactory frame of mind for an official; but we fancy that the report has told the ratepayers something that they did not know before; to them we look to champion the cause of the hapless poor who are left to the tender mercies of the Stockport Guardians.

STOKE-UPON-TRENT.

STOKE-UPON-TRENT is advertising for a nurse for the union infirmary and offering a salary of £27 10s. for a competent trained nurse who "has had experience in midwifery." We conclude that the Board does not require a certificate in the latter respect as they offer a low salary. Is not this cheereparing unworthy of the Guardians of such a large and important union? The night nurse is offered £22 10s. We infer from these figures that this night nurse would find a colleague, otherwise the work required, if conscientiously performed, should stand at a higher figure than the above.

CHESTERTON.

The Board of Guardians, advised by the inspector, Mr. Peel, has decided to refuse admission to our Commissioner whenever that individual knocks at its gates. Mr. Peel is pleased to criticise the reports published in the *BRITISH MEDICAL JOURNAL* as inaccurate. Was Hatfield inaccurate? Was Bedford inaccurate? We shall not be surprised to find that Mr. Peel makes similar suggestions all round his district and then we shall know the reason why.

BRAINTREE.

We have been watching the progress of events at Braintree with some interest. The Board admit that the infirmary is overcrowded, and we were informed that the plans were awaiting the approval of the Local Government Board. In the report of the meeting held October 10th, we read that, with certain modifications, all within the limits of practicability, these plans are accepted by the Local Government Board, and the resolution arrived at after the waste of valuable time was against the modifications, thus shunting the whole question. We can only infer that this conduct is suggested as an object lesson to the electoral body not to re-elect this present Board; no doubt it will answer the purpose.

KIDDERMINSTER.

The Kidderminster Board is having a controversy with its medical officer about the nursing question. It seems that on account of a case of measles and another of typhoid fever, extra nurses are required. One of the guardians says that "typhoid fever patients were treated in their own homes, and that it was not considered that they required special nurses," and the case of measles is spoken of as "a paltry case of measles." Would it not be well if the guardians accepted the position that the medical officer holds as skilled adviser to the Board on medical questions, and believe that in asking for trained nurses he gives the sick pauper the best chance of life. We see that the Kidderminster Workhouse deals with over 150 sick without the services of trained nurses; there are three nurses untrained. Perhaps if the permanent staff consisted of trained nurses these extra demands might be avoided.

WORKHOUSE ATTENDANTS.

"LADY MEATH'S appeal for recruits to her new organisation of workhouse attendants will," says the *Local Government Journal*, "be heartily responded to. Her ladyship's name in connection with any movement for the welfare of the poor and helpless people is sufficient to stamp the movement with the hall mark of genuineness. The *BRITISH MEDICAL JOURNAL* is doing an immense good in pointing out the deficiencies which exist in the proper treatment of the sick poor in our provincial workhouses, and Lady Meath's organisation is one which will help to remedy the evils complained of."

THE LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.—A West Kent Division of the London and Counties Medical Protection Society, Limited, was founded at a meeting held at St. Bartholomew's Hospital, Chatham, on October 13th, when the Treasurer (Dr. Heron) explained the objects and scope of the Society. Subsequently Dr. G. V. Bell, of Rochester, was elected President, and Mr. William A. Dartnell, L.R.C.P. and S., of Rochester, Honorary Secretary. Vice-Presidents and a Council were also chosen.

THE ANTITOXIN TREATMENT OF DIPHTHERIA.

M. ROUX AT THE INSTITUT PASTEUR.

"ANTITOXIN" and the serum treatment of diphtheria forms a subject so striking as to fill the minds of the French public with keen interest. It has there been fanned by the fantastic journalism of Paris, and made to form the subject of a national self-glorification which has, in this case, absolutely no grounds. It is a purely German invention, and France has done nothing but adopt it with a theatrical display which, under the circumstances, is humiliating for a country which need not strut in borrowed plumes. The microbe of diphtheria is a German discovery, and the antitoxin and its application are German discoveries. It is distressing to find the whole matter boomed by the *Figaro* and the municipality of Paris as another "glory" of France. The public subscription raised is a folly, and the medal struck a fraud, and we have no doubt that M. Roux is heartily ashamed of the whole affair. But with a view of ascertaining what the real facts in France are and what that truthful and accomplished *savant*, M. Roux, says for himself as distinct from what sensational journalism says, we have sent a representative to Paris to take from himself his own views on the matter. It will be seen that he fully admits the correctness of our view. Our correspondent was instructed to note the special circumstances, if there were any, under which the clinical investigations had been made. M. E. Roux, who is "the man of the hour" in Paris, pictures and paintings of whom adorn the walls of the newspaper offices, cordially received our representative, and showed him what material was at disposal in Paris.

MUNICIPAL INTEREST.

M. Roux seemed pleased that the municipal authorities of Paris had manifested some interest in the work which he has brought to such a stage of perfection, and expressed his pleasure that the Government had taken steps to secure that the "materies efficiens" for the abolishment of diphtheria should be prepared in sufficient quantities to supply the provinces as well.

The history of the discovery has been already set forth in the columns of the *BRITISH MEDICAL JOURNAL*. It originated in experimental researches on animals by Behring in Germany and has during three years stood the test. It is now nearly a year since Roux, strictly following Behring in all particulars after testing his experiments by repeating them, demonstrated the results of his investigations at the Hôpital des Enfants in Paris, and he referred with pride to the fact that the town of Paris and the Government had decided to give sufficient subventions so that the whole of the population may be supplied with what is needed.

THE COST OF PRODUCTION.

In reply to inquiries which our Commissioner made upon the subject of the magnitude of the needs of Paris in respect of diphtheria, M. Roux remarked that in Paris at present there were from 8,000 to 10,000 cases of diphtheria. In this estimate he did not include cases of which the diagnosis was as yet uncertain, but upon which the serum would necessarily have to be employed. Roughly speaking the department of the Seine contains a population of two millions and a-half. In order to supply the needs of this vast community the cost of production is estimated in the following manner. It requires twenty horses to be provided; to attend to them three grooms are necessary. Then the serum is prepared by two bacteriologists and two laboratory assistants. M. Roux puts the estimate of the cost of the horses at £40 per horse per annum. "That," he said, "would be quite enough." In other words, the cost of production would imply the purchase of twenty horses costing, say, 1,000 francs per annum each, and for the necessary attendance of the animals and the preparation of the serum half as much again would be required, amounting in all to 40,000 francs or £1,600 yearly. In this estimate M. Roux modestly excluded any reference to his own work, and the great scientific services which he has rendered not only to France but to mankind.

In the course of conversation with some influential Parisians the opinion was expressed that M. Roux ought not to be excluded from State consideration. It is a common observation that the rewards of science in a monetary point of view are rare and small. M. Roux might have become a millionaire if he had traded with his discoveries. But the true scientist is not a trader. The public whom he has benefited should therefore not be unwilling to express their gratefulness in a manner more tangible than the mere personal decorations with which it is rumoured the Municipality of Paris wish to honour the *savant*. And therefore, although the figure is estimated at £2,000, the consideration of other matters should not be left out of account.

In reply to a request for an account of the steps by which the evidence had been arrived at, he said: "It is extremely simple. Loeffler and Klebs discovered the microbe of diphtheria, and studied its life history. Roux and Yersin, studying its clinical aspects, demonstrated that this bacillus was capable of evolving toxic material, and this was the starting point of the discovery of the toxin of tetanus and of several other microbial toxins. Now M. Behring has been able to derive an antitoxin." How Behring came to think of this M. Roux could not undertake to say. The steps of the process were these:

1. The discovery of the microbe. Loeffler and Klebs.
2. The proof that the microbe produces diphtheria.
3. The diphtheria poison isolated. Roux and Yersin.
4. The counterpoison obtained. Behring.

"Behring, therefore," said M. Roux, "has completed and crowned the edifice." When Loeffler discovered the microbe, doubts existed whether it was the real producer of diphtheria because the discoverer had failed to produce diphtheria paralysis with the microbe. This Roux and Yersin afterwards succeeded in doing. Then they proved that its toxin (which they had discovered) gave exactly the same disease as the microbe itself, and that consequently the microbe only acted through its toxin. Behring discovered the antitoxin, which is the serum of animals rendered immune against the action of the toxin.

HOW THE PREPARATION IS MADE.

In preparing the serum at the Institut Pasteur the investigators are most careful to select the best animals. The horse is the creature most suited for its preparation, although goats, sheep, and rabbits may also be employed. These animals frequently die at first when inoculated with the toxin, whereas the horse does not. Other animals require habituating to the poison, but the horse takes it more readily; little by little it is made to stand stronger and stronger doses. When the animal can stand without being ill considerable doses of the toxin, its serum then becomes the antidote or cure or remedy for diphtheria, this last being the discovery of M. Behring. "Of course," he continued, "there are many modifications in the application, but that is the broad principle."

THE EFFECT ON MORTALITY.

M. Roux alluded to his paper, read at Buda-Pesth, in which he related his personal experience of more than 200 cases, and there are statistics of many hundreds in other countries.

Our representative, inquiring upon this point, was informed that in Paris the mortality had diminished by one-half, and since the Buda-Pesth paper was read the statistics show yet a further reduction. For Paris, he explained the total mortality had scarcely ever been below 50 per cent. previous to the serum treatment. It was now less than 24 per cent.

"But," said our correspondent, "that is just equal to what is stated to be the average mortality from diphtheria in London." "That cannot be true," he replied. "Our cases mean those only which have, by microscopic and bacteriological examination, been proved to be actual diphtheria. The statistics are not based upon vague assertions or mere statements. In these cases there are at least 50 per cent. of deaths in the hospitals of Paris."

The following figures are taken from the paper read at Buda-Pesth:

Everyday visits were made to the ward, and children were

treated just as they were found. No selection of cases was made, so that the results of each month and the treatment may fairly be compared with those obtained before. Nothing has been changed in the care given to the sick, and the local treatment has remained the same (glycerine and salicylic acid with boric water). The serum is the only new element introduced. It is therefore to it alone that the results must be attributed. The statistics relating to the treatment of diphtheria were drawn up with the greatest care by the director of the hospital, and by the lady superintendent, and they supply the necessary elements for comparison. Finally the experiments were continued from February 1st, 1894, to July 24th, during the winter months when diphtheria is most frequent and severe, and also during the summer months, when it is rarer and of a milder type. There is another hospital for children in Paris, the Trousseau Hospital, where the serum was not employed, and this will serve as a means of comparison.

Total mortality in the diphtheria wards during the last four years = 51.71 per cent.:

From February 1st to July 24th, 1894, with the serum treatment was employed to 448 children. There were 109 deaths, being a mortality of 24.5 per cent. The other conditions remaining the same, the difference between 51 per cent. and 24.5 per cent. represents the measure of the benefit resulting from the treatment.

At the Trousseau Hospital during the same time there were 520 diphtheria cases, none of which were treated with the serum, and of this number 316 died, being equal to a mortality of 60 per cent.

It will not therefore be said that the epidemic during which the researches were made was a benign one. In simple diphtheria not requiring tracheotomy the mortality for the last four years was 33.94 per cent. During the months of trial at L'Hôpital des Enfants it fell to 12 per cent. During the same time at the Trousseau Hospital the mortality was 32 per cent.

In the "Croup Opérés" cases requiring tracheotomy the four years' mortality was 73.19 per cent.; with the treatment it fell to 49 per cent. During the same time at the Trousseau Hospital the mortality where no serum was employed was 86 per cent. The above figures are absolutely comparable one with the other, and they are full of eloquence. They proclaim the good effects produced by the antidiphtheric serum.

THE SUPPLY ABROAD.

Nearly similar results had been obtained in other countries, and these, of course, can be provided for according to the means at their disposal. "Any skilful bacteriologist," he added, "well acquainted with diphtheria would be capable of preparing the serum, and therefore there is no reason why it should not be equally well prepared out of France."

THE DISTRIBUTION OF THE SUPPLY.

Thinking of some of the consequences which might accrue from creating a Government monopoly for the sale of the medicament in France, our representative inquired why they were not willing to make it free to all. The reply was a just one. By doing this, absolute waste and useless employment of the serum would be prevented; and M. Roux was of opinion that it would be well that those who could afford to pay should be made to pay a small sum. M. Roux suggested that this requirement of the Government was probably made with the view of preventing abuses, which might so easily be brought about if the preparation and sale of the serum were to be left in the hands of interested vendors. For hospitals and dispensaries, and for the poor, the remedy should, in his opinion, be gratuitous. The object of the payment would be simply to prevent waste, and not to bring in any resources to the Municipality or to the Government. The scientific authorities, however, at the Institute have declined, very properly so, to have anything to do with this aspect of the question. They are asked to manufacture the serum, and they do so. "If the Government," added M. Roux, "choose to charge wealthy people for it, they do so upon their own responsibility and not upon ours."

THE CLINICAL TREATMENT.

Having expressed a desire to see the arrangements which

had been made for the application of the treatment, M. Roux expressed the opinion that there was nothing special to be seen in them. Doubtless there were cases of pneumonia and scarlet fever to be found in the diphtheria wards of the Hôpital des Enfants. But they were intercurrent diseases, and had not been introduced into the wards originally. The diphtheria cases were isolated in special pavilions in both the Hôpital des Enfants and the Trousseau. Pneumonias were frequent complications of diphtheria, and, on the other hand, diphtheria was often a complication of scarlet fever. "Of course," M. Roux added, "isolation is not as perfect in Paris as it should be," because the means at disposal were not sufficiently ample. In any case, the specific diseases are only mixed with those particular forms of disease which are apt to become complications.

XVI.—DR. JOHN T. MALCOLM (Dornoch, Sutherland) sends the following case:

A boy, aged 13, with a history of a "weak" throat, was confined to bed on September 17th, 1894, complaining of sore throat, with difficulty of swallowing. I saw him on September 19th, and found the throat, including the tonsils and uvula, covered with diphtheritic membrane. The tonsils were greatly inflamed, the pulse was 80, the temperature 100° F.; the tongue was greatly swollen.

On September 21st, at 8 P.M., the temperature was 100°, the pulse 84, jerky, and of high tension. At 9 P.M. I injected into the back m 40 of Dr. Aronson's antitoxin. At 10 P.M. the temperature was 101°, the pulse 80, soft, and of low tension.

On September 22nd, at 10.30 A.M., the temperature was 99.6° and the pulse 76. He expectorated large masses of membranes like small bits of tripe, one fragment being about an inch and a-half long. After the injection he fell into a gentle slumber, which lasted five hours. At 9.30 P.M. the temperature was 99° F., and the pulse 76. The glands at the angle of the jaw were greatly swollen.

On September 23rd, at 11.30 A.M., the pulse was 68, and the temperature 99.2° F. He had passed a quiet night. He swallowed better, and his throat was greatly cleared, only two small patches remaining on the uvula. At 9 P.M. the temperature was 99.2° F., and the pulse 72, of very low tension, with peculiar rhythm, there being a gradual ascent and a gradual descent in the intensity of the beat, until the latter intermitted for a moment, when the gradual ascent again took place. This alternate rise and fall went on for a few days, and appeared to be related to the injection of the antitoxin.

On September 25th the temperature was 100°, and the pulse 80. The patient was now swallowing well and sleeping well.

On October 18th the patient was going about the house and regaining health and strength.

Remarks.—This was a severe case of diphtheria. The boy could not swallow either food or medicine, nor open his mouth sufficiently to paint or spray the throat. A fatal termination was apprehended. There have been 4 cases of diphtheria within twenty yards of his home, three in one family, of whom all died from extension of the disease to the lungs. In one of the fatal cases tracheotomy was resorted to. The outbreak was apparently related to a ventilating sewer shaft, about 15 yards from the dwelling house of one of the patients. In all there have been eight cases of diphtheria within a radius of a hundred yards, with five recoveries. The good effects of the antitoxin were: (1) The profuse expectoration of membranes; (2) the quiet and ease the patient enjoyed after the injection, being apparently free from all suffering. Dr. Love, who happened to be staying with me, verified the diagnosis, and was convinced with myself that the recovery of the patient could only be ascribed to the timely use of the antitoxin, which was obtained from Messrs. Zimmerman, London.

THE report of the Committee (MM. Bergeron, Cadet de Gassicourt, Proust, and Straus) appointed by the Paris Academy of Medicine to consider the value of the serum treatment of diphtheria was presented at the meeting of that

body on October 16th, and is published in the *Bulletin de l'Académie de Médecine*, 3rd Série, t. xxxii, No. 42. The priority of Behring is fully acknowledged, but it is pointed out that his work is based on the discoveries of Pasteur and his school. A brief account of the mode of preparing the serum, and a summary of Roux's statistics are given. Two members of the Committee, MM. Bergeron and Cadet de Gassicourt, who are specially interested in infantile pathology, watched the results of the treatment in M. Moizard's service in the Hôpital Trousseau. "The effects obtained seemed to them altogether remarkable, notably the striking improvement in the general condition, the rapid subsidence of the fever after the injection, the absence of pallor, depression, and prostration in the little patients." The Committee says there is every reason to believe that the serum has the like protective influence in man that it has in animals; therefore it can only be advantageous to make preventive inoculations of the serum in healthy persons, especially in children exposed to infection. The Committee concluded that "we are now in possession of a specific treatment of diphtheria as powerful as it is harmless." It is urged that the Pasteur Institute should be placed in a position to keep up an adequate supply of serum.

In France public bodies are vying with each other in voting money for the provision and maintenance of a supply of serum. The Chamber of Deputies has sanctioned a grant of £4,000; the Conseil Général of the Seine Department is invited by its President, M. Bassinet, to make a grant of £400; the Municipal Council of Paris has decided to grant a subvention of £800 a year for the up-keep of stables with twenty horses for the supply of serum for the Department of the Seine. The stables, which will be placed at the disposal of the Pasteur Institute, are annexes of the municipal slaughterhouses at Grenelle and Villejuif. The Council has further decided to organise a *fête* at the Hôtel de Ville in honour of MM. Pasteur and Roux, when a medal will be presented to the latter in the name of the City of Paris. The Comité d'Hygiène de France has passed a resolution urging that a regular subvention should be made by the State to the Pasteur Institute for the preparation and distribution of the serum. The President of the French Republic has sent M. Roux £200 for the same purpose, and has expressed his intention of personally visiting the Institute to see the method of preparing the serum, and one of the children's hospitals to see the manner of using it.

In the French provinces the enthusiasm for the new treatment is showing itself in a no less practical form. Troyes (Aube) has voted £20 for the provision of a supply of serum for the town; Béziers has voted the same amount to the Pasteur Institute; Marseilles, besides contributing £40 to the public subscription opened in Paris, is taking steps for the establishment of a local "antidiphtherial institute." At Puy (Haute Loire) a public festival for the benefit of the Pasteur Institute was organised under the auspices of the municipality. Orleans, which already makes an annual grant of £20 to the Pasteur Institute, has voted a further subvention of £10 in aid of M. Roux's work. In Maine et Loire a public subscription has been opened for the purchase of serum; a subscription has been opened for the same purpose by the *Petit Courrier* of Angers, and Dr. Guignard, Mayor of that town and a member of the Chamber of Deputies, will ask the Municipal Council at its next meeting to vote a subvention for the same purpose. Rouen has already provided itself with horses, and a supply of serum is being prepared by Dr. Nicolle, a former pupil of the Pasteur Institute, and now one of the staff of the Bacteriological Laboratory of Rouen. The *Journal de Rouen* has opened a subscription which within a few days amounted to £2,000. Toulon has voted £200 for despatching a medical man to the Pasteur Institute to familiarise himself with the method of preparing the serum with a view to the establishment of an antidiphtheria service in that town. Draguignan (Var) has voted £20 to the Pasteur Institute for the supply of serum. Nancy has voted £40 for the same purpose.

In the Austrian Chamber of Deputies, in reply to Dr. Dvorak, the Minister of the Interior, Count Palffy agreed in the name of the Government that provision should be made in this year's budget for the expenses of a thorough investigation of the effects of the diphtheria antitoxin.